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# Developing Academic Vocabulary Independently (DAVI): A usability study

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**Developing Academic Vocabulary Independently (DAVI): A usability study**

by

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A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

**MASTER OF ARTS**

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(English for Specific Purposes)

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## ABSTRACT

Second language (L2) learners preparing for academic study in English-speaking universities face major challenges in acquiring needed vocabulary that classroom study cannot fully overcome. According to recent second language vocabulary acquisition (SLVA) research, learners must deeply process target vocabulary in comprehensible contexts appropriately spaced over time. However, effective materials facilitating such encounters outside the classroom are rare. This paper reports the results of a usability study for the researcher's learning system called DAVI (Developing Academic Vocabulary Independently), a system designed in light of the SLVA literature to help students independently acquire Academic Word List (AWL) vocabulary. DAVI uses Microsoft Excel-based vocabulary study pages that seek to encourage learners to manipulate target vocabulary in meaningful tasks, including Google searches within learner-friendly websites. Chinese students studying in an intensive English program at the high-intermediate level used a pilot version of DAVI during fall 2009, providing data to the teacher-researcher by such means as her observation of participants' use of the system, learners' DAVI assignment uploads, and a final questionnaire. These data were used to determine whether students thought DAVI benefited their vocabulary acquisition, how the way in which they used DAVI may have affected their vocabulary acquisition, and what vocabulary study methods they prefer. Results suggest that the present version of DAVI was too technologically challenging for participants and violated their preferences for more traditional methods of vocabulary study. Results also indicated web-based vocabulary development resources for students at this level are inadequate, suggesting that a Learner-Comprehensible corpus be built specifically to support AWL acquisition.



## CHAPTER 1. INTRODUCTION

Many, if not most, second language (L2) learners view lack of vocabulary as their single largest problem in L2 communication (Krashen, 1989). Certainly I do as an L2 learner of Mandarin Chinese. In fact, my conviction that if I could just learn enough vocabulary, I would no longer have trouble functioning effectively in Chinese, is what originally aroused my interest in studying the vocabulary acquisition research. My work as a teacher of L2 English learners further focused my pursuit of vocabulary acquisition understanding. I saw my intensive English program (IEP) students using techniques for learning vocabulary I was certain were less than optimal as they struggled to prepare for TOEFL (Test of English as a Foreign Language) with the goal of soon beginning content study in U.S. universities, yet I had no alternative methods to suggest that I knew to be effective. This brought me to the research looking for answers to questions including: “How is vocabulary learned? How can L2 students be helped to study academic vocabulary effectively?”

My continued interaction with students whose academic goals were on hold and who were sometimes under great financial pressure because of their failure to pass TOEFL or other language-based gate-keeping exams and begin university study soon added the question “How can L2 students be helped to study academic vocabulary *efficiently*?” In spite of the claims of researchers such as Krashen (1989) that L2 learners should learn vocabulary the same way L1 learners acquire their rich vocabularies, via incidental acquisition through reading, I could not help but agree with the many researchers who contend that incidental vocabulary acquisition takes place more slowly than most L2 learners can afford. I read the research searching for a way out of the paradox aptly expressed by Krashen, “Vocabulary teaching methods that attempt to do what reading does—give the student a complete knowledge of the word—are not efficient, and those that are efficient result in superficial knowledge” (1989, p. 450). While Krashen may be overstating the case somewhat in saying that reading provides us with *complete* knowledge of vocabulary, he is certainly correct that it facilitates a much more thorough acquisition of the form, meaning, collocations, and register of target vocabulary, than the memorization of L2 target words in conjunction with an L1 translation, the efficient vocabulary learning method preferred by my students.

While the second language vocabulary acquisition (SLVA) research has identified several principles key to the design of any materials or technique aimed to help L2 English learners acquire academic vocabulary, it has not provided a clear-cut system or systems that escape the dilemma described by Krashen. As a result, I created my own academic vocabulary learning system in light of the principles and findings of the SLVA research, a system I called DAVI (Developing Academic Vocabulary Independently; pronounced “Davy”).

### **Research Questions**

This paper describes a usability study for DAVI addressing the following questions:

- 1) Did the intermediate IEP learners in this study think DAVI is an effective means of acquiring academic vocabulary?
- 2) How are the ways in which learners completed one or more of the tasks in DAVI likely to have affected their academic vocabulary acquisition?
- 3) Are there other vocabulary learning methods learners preferred?

The vocabulary learning tasks utilized in DAVI differ significantly from the simple memorization of L1-L2 words pairs described earlier, the most commonly used vocabulary study method among the L2 English learners I have observed, and this could affect how motivated learners are to use the system. It is this concern that motivates question #1. In addition, learners’ interest in DAVI and view of its usefulness is likely to depend on the way in which they complete the different tasks built into DAVI, and it is this that motivates the second question. The reason for the third question is that information about learners’ preferred vocabulary study methods could enable vocabulary materials design personnel to shape materials, inasmuch as consistency with the vocabulary acquisition research allows, to match students’ beliefs about the best means of learning vocabulary. In cases where the vocabulary acquisition research and students’ beliefs about how vocabulary is acquired conflict, an answer to research question #3 could help materials designers “market” their

curricula in light of learners' real beliefs rather than according to their suppositions about these beliefs.

### **Importance of this Study**

This study was undertaken to determine whether further development of DAVI, with the goal of making it available online to support the academic vocabulary acquisition of L2 learners around the world, was merited. It also is intended to encourage continued research on materials and techniques that attempt to marry the seemingly paradoxical goals of effective and efficient vocabulary acquisition.

### **Organization of this Study**

The key principles of vocabulary acquisition upon which DAVI is founded are presented in chapter 2 of this paper. Chapter 3 describes DAVI and the usability study methodology. Chapter 4 details the results of the usability study and chapter 5 outlines its major findings, limitations, materials design and pedagogical implications, and suggestions for further research.

## **CHAPTER 2. LITERATURE REVIEW**

DAVI, like any method or materials designed to help intermediate L2 English learners develop their academic vocabulary, must be tested against the second language vocabulary acquisition (SLVA) research. In this chapter, I do this by first justifying the use of the General Service List (GSL) and Academic Word List (AWL) to define “core” and academic English vocabulary respectively; by explaining the theoretical foundation for DAVI’s collocational focus; by describing the L2 vocabulary acquisition research on which DAVI is founded, particularly that regarding the importance of noticing, contextualization, repetition, and depth of processing; and by surveying the findings of research on computer-assisted vocabulary learning.

### **What Vocabulary Should Academically Oriented L2 English Learners Learn?**

#### **The General Service List and Academic Word List**

Vocabulary researchers agree that about 2000 words make up the core vocabulary of English (Nation, 2001; Schmitt, 2000). Though it is not without problems (Nation & Deweerdt, 2001), the standard list used in the literature for identifying these basic words of English is Michael West’s General Service List (as cited in Nation, 2001, p. 15 & Schmitt, 2000, p. 143). Students’ first priority needs to be mastery of these highly frequent basic words of English, as roughly 80% of any academic text consists of them (Nation, 2001).

Once academically oriented students have mastered the General Service List (GSL), they need to set their sights on the Academic Word List (Coxhead, 2000). The Academic Word List (AWL) was derived by means of a 3,500,000 word corpus built of academic texts from the four general disciplines of science, commerce, law, and the arts (Coxhead, 2000). Each of the four subcorpora has an equal number of running words as Coxhead’s goal was to identify a subtechnical list of academic vocabulary frequent in academic texts from any domain, but not necessarily frequent in non-academic genres. The result of Coxhead’s

research is a list of 570 word families--that is, headwords plus all inflected forms and frequent, regular derivational forms--that provides 12% coverage of her commerce corpus and a little over 9% coverage for each of the other corpora (Coxhead, 2000). The value of this can be seen if one contrasts the 9%-plus academic text coverage provided by the AWL with the 4.3% academic text coverage provided by the thousand most frequent words of English following the GSL (Nation, 2001). However, the individual words of the AWL are not in themselves enough, for as Nick Ellis (as cited in Nation, 2001, p. 318) argues, language knowledge IS collocational knowledge. Learners need to master lexical chunks, not merely lists of individual words.

### **Lexical chunks**

Theories of second language acquisition abound, but it has been cognitive models of L2 acquisition, perhaps most markedly those of connectionism, that are largely dominant in the research on L2 vocabulary acquisition. Among other things, connectionism posits that language (including lexis) is learned, stored in the mind, and applied to communication largely as “chunks,” whether in idioms like “strong tea” or in compositional (i.e. “the-whole-equals-the-sum-of-its-parts”) collocations like “strong man,” because of working memory limitations. It is much more taxing on working memory to build chunks from items stored individually than to retrieve chunks stored as wholes (R. Ellis, 2008; N. Ellis, 2008). In Schmitt’s words, “The mind makes use of a relatively abundant resource (long-term memory) to compensate for a relative lack in another (processing capacity) by storing a number of frequently needed lexical chunks as individual whole units” (2000, p. 101). Ready-made collocational strings allow for efficient language processing because they enable the brain to avoid jumping through the hoop of applying grammar rules to individual words in order to process input and produce output.

The learning of chunks has other benefits as well. Some lexical chunks are idiomatic, unable to be understood by the application of grammar rules to individual words. The inadequacy of grammar plus individual lexical items can further be seen in that not every grammatically possible word combination is standard. As Webb (2007b) points out, while it may be grammatically possible to say “powerful tea” and “strong engine,” English speakers

are much more likely to say “strong tea” and “powerful engine.” That is, apparent synonyms may collocate quite differently and unless learners acquire the chunks in which the apparent synonyms are embedded, it will be difficult for them to avoid nonstandard phrasing as they engage in language production (cf. N. Ellis, 2008; Kennedy, 2008; Handl, 2008).

While students are generally aware of idioms and interested in learning them, they are rarely cognizant of the “chunkishness” of language generally, for the white space on either side of English words suggests to them that words are basically isolated entities (Granger and Meunier, 2008; Wible, 2008). The absence of formal evidence that a given word might be part of a larger whole is not helped by the fact that lexical chunks can vary widely in their fixedness, from idioms and fixed compounds that permit no variation to phrases that readily allow any of several variant forms and are often compositional (Handl, 2008).

Any attempt at this time to incorporate the teaching of phraseology into vocabulary teaching is necessarily tentative, for as Coxhead (2008) writes, “The lack of theoretical underpinnings directly related to teaching and learning collocations and phrases causes difficulty” and “Research into whether current teaching methodologies are successful in their approach to teaching and learning such sequences is [just] beginning” (p. 159). Nevertheless, it seems clear that academically oriented learners should be made aware that they need not only learn the GSL and AWL vocabulary proper, but also the lexical chunks within which target vocabulary are embedded, to increase their L2 language processing effectiveness and efficiency, to increase their understanding of idiomatic input, and to produce both compositional and idiomatic output in a standard form. This raises the question, though, of *how* L2 vocabulary acquisition takes place and whether and how it can be facilitated by intentional action by the learner and the teacher. To that question we now turn.

## **L2 Vocabulary Acquisition**

### **Incidental vocabulary acquisition vs. intentional vocabulary learning**

Native speakers of a language largely acquire their vocabulary incidentally in the process of focusing on meaning in communication. Certain second language vocabulary

acquisition (SLVA) researchers believe that L2 learners of a language can and should do the same. Perhaps most notable among these is Krashen, who writes, “Comprehensible input alone can do the entire job for vocabulary [acquisition]” (Krashen, 1989, p. 448).

SLVA researchers who disagree with Krashen’s stance on comprehensible input being sufficient in itself point out that the majority of L2 learners, particularly those intending to study academic content in their L2, cannot afford the time necessary to incidentally acquire the thousands of words their academic goals demand—incidental vocabulary acquisition simply takes place too slowly (Horst & Cobb, 2001; Schmitt, 2000; Cobb, 1998; Krashen, 1989). These researchers argue that L2 learners need to supplement their incidental vocabulary acquisition with intentional vocabulary learning, the first step of which is noticing the vocabulary to be learned.

### **The importance of noticing**

Krashen’s Input Hypothesis explicitly rejects the noticing of input as beneficial to language acquisition: “Language is subconsciously acquired—while you are acquiring, you don’t know you are acquiring; your conscious focus is on the message, not form” (Krashen, 1989, p. 440). However, while the Input Hypothesis appears able to explain the acquisition of some aspects of word knowledge, such as spelling, quite well, many researchers believe its explanation of how L2 learners acquire many of the other aspects of word knowledge is far from satisfactory (Laufer & Hulstijn, 2001; Horst, Cobb, & Meara, 1998; Pigada & Schmitt, 2006). These researchers largely agree with Schmidt, who wrote:

Since many features of L2 input are likely to be infrequent, non-salient, and communicatively redundant, intentionally focused attention may be a practical (though not theoretical) necessity for successful language learning. Language learners who take a totally passive approach to learning, waiting patiently and depending on involuntary attentional processes to trigger automatic noticing, are likely to be slow and unsuccessful learners (Schmidt, 2000, as quoted in Laufer & Hulstijn, 2001, p. 4).

To facilitate learners’ noticing of target vocabulary and sometimes its collocates, materials designers, researchers, and teachers regularly use textual enhancements (e.g. bold, italics, or

underlined font) to increase the salience of the item or phrase to be learned (Coxhead, 2008). Yet the mere noticing of unfamiliar vocabulary does not guarantee its acquisition. Rather, research indicates vocabulary acquisition derives from several additional factors as well. Incidental acquisition of semantic aspects of target vocabulary appears dependent on the nature of the context surrounding it and of both formal and semantic aspects of the vocabulary on one's repeatedly encountering it. The key factor in intentional vocabulary acquisition, particularly of semantic and collocational aspects of target vocabulary, on the other hand, is the deep processing of target words. We will now look at each of these factors in more detail.

### **The role of context in vocabulary acquisition**

Assuming learners encounter target vocabulary in context rather than in a word list or other decontextualized form, the context can play a significant role in whether or not learners gain initial acquisition of target vocabulary. Two key research findings relative to this point are worthy of note. First, Liu and Nation (1985) found that learners need to encounter target vocabulary in a context containing 95-98% known words if they are to be able to gain it incidentally. Mastery of the GSL and AWL along with knowledge of a field's technical vocabulary basically brings academic readers up to the 95% known-words threshold (Nation, 2001), but prior to students' having gained such a solid vocabulary foundation, it is difficult to find authentic materials providing a balance of 95-98% comprehensible input joined to vocabulary students need to learn, such as AWL vocabulary (Nation, 2001). For this reason, researchers such as Nation and Deweerdt (2001) and Beck, McKeown, and McCaslin (1983) argue that simplified or pedagogical contexts are generally superior to authentic contexts for promoting intermediate learners' vocabulary development.

This brings us to the other key point to be made about the impact of context on vocabulary acquisition. While people do often learn vocabulary by guessing its meaning from context, contexts can be differentially informative (Beck et al., 1983; Webb, 2008). Pedagogical contexts are specifically designed to help students accurately guess the meaning of unknown vocabulary, but natural contexts range widely in how informative they are about the meaning of unfamiliar words (Figure 1).



misdirective ↔ nondirective ↔ general ↔ directive

*Figure 1. Continuum of natural context informativeness. (based on Beck et al., 1983)*

As Beck et al. (1983) indicate and as shown in Figure 1, natural contexts can be misdirective (leading a student to incorrectly guess the meaning of a target word), nondirective (providing no information about the meaning of the word), general (providing enough information to permit the learner to accurately guess the general sense of the word), or directive (providing enough information for the learner to exactly identify word meaning). It does not necessarily follow, however, that materials designers ought always to choose directive contexts when incorporating authentic sources into their materials. In fact, overly transparent contexts can negatively affect the likelihood that learners will acquire target vocabulary, simply because such contexts can render grappling with an unfamiliar word unnecessary for learners, as they can understand the discourse without it (Nation, 2001). On the other hand, materials designers must not swing too far to the other side of the context informativeness continuum, for if a context is misdirective, it can actually delay a student's acquisition of a word, increasing the number of repetitions the student will need to master it (Pigada & Schmitt, 2006). This leads us to the next factor impinging on vocabulary acquisition, repetition.

### **The role of repetition in vocabulary acquisition**

The number of repetitions needed for learners to fully acquire a target word remains up for debate, probably because there is no “magic number.” For one thing, there are many things to be learned about a word and while some of them, such as knowledge of form, do seem to be responsive to repetition, other aspects like meaning appear more susceptible to other factors, such as the quality of the word's context as discussed in the previous section. In addition, certain kinds of words are apparently more easily learnable than others, e.g. concrete nouns (Horst et al., 1998; Coxhead, 2008) and thus require fewer repetitions.

However, the biggest reason it is impossible for vocabulary researchers to pin down the exact number of repetitions a learner will need to acquire any given word is simply

because it varies from learner to learner depending on what they already know and clearly, the knowledge base from which different learners approach the task of learning a given word varies. We can see how this works by considering the impact of synonymy, antonymy, hyponymy (superordinate-to-subordinate), and meronymy (whole-to-part) on vocabulary acquisition. Many research studies have made it clear that if a learner attempts to learn synonyms or other members of a “lexical set” simultaneously, the acquisition of both will be greatly hindered because the two items will tend to get confused in the learner’s mind (Nation, 2000; Webb, 2007b). If however, a learner already knows the synonym for a target word, Webb’s (2007b) research indicates that that synonym knowledge can facilitate acquisition of the target word.

Other learner-dependent factors play into how much repetition will be needed as well. If a target word follows patterns (e.g. morphological or collocational) and represents knowledge familiar to the learner, its “learning burden” will tend to be quite light. If, however, a target word’s patterns are unfamiliar and represent an unfamiliar concept, a learner is likely to find the word’s learning burden very heavy (Nation, 2001). Other learner-related factors, including variation in motivation to learn a given word and in language-learning aptitude, can also play a part. It is understandable, then, that estimates in the research literature regarding how often learners must encounter a word to acquire it vary so widely, from 6-20 repetitions (Webb, 2007a).

While there is no definitive number of repetitions that can guarantee students’ acquisition of any given word, an empirical study by Webb (2007a) indicates that at least up to 10 repetitions, repetition of target words in context can continue to produce measurable gains in word knowledge. In his study, repetition initially resulted in students’ acquisition of a word’s spelling, grammatical function, and syntagmatic associates (i.e. if the target word is “train,” a syntagmatic associate would be “station”) and productive knowledge of its paradigmatic associates (i.e. if the target word is “sofa,” “chair,” “cushion,” and “furniture” would all be paradigmatic associates). Further repetitions were required before students gained a clear understanding of the target word’s meaning (defined productively by the ability to give an L1 translation and receptively by the ability to recognize an L2 synonym they’d already learned that matched the target word). Once students had acquired word

meaning, repetition continued to bring about development in students' receptive and productive knowledge of syntagmatic and paradigmatic associates. Pigada & Schmitt (2006) report similar findings.

A weakness of many vocabulary acquisition studies, including the Webb study just described, are that they test acquisition immediately after exposure to the target vocabulary, a fact that precludes them from offering insight into the likelihood of students' long-term retention of the vocabulary they have acquired (Pigada & Schmitt, 2006; Horst et al., 1998; Day, Omura, & Hiramatsu, 1991). As learners' natural forgetting tendency is well-confirmed in the research, this is not insignificant. Nation (2001) cites several researchers whose work has confirmed that massed repetition is less effective than spaced repetition and that most forgetting takes place soon after initial learning. Ideally, repetition would take place once a learner has forgotten enough about a word that he or she recognizes the value of reviewing it, but before he or she loses access to the memory trace originally created by the initial word-learning (Nation, 2001). Unfortunately, the factors that render it impossible for SLVA researchers to neatly delimit the *number* of repetitions needed to acquire a given word or collocation also apply to how those repetitions should be *spaced*, with similar consequences—there is and can be no hard-and-fast rule.

Nevertheless, the finding that initial learning is fragile and likely to be lost without reinforcement soon after the learning does have implications for what a schedule of spaced repetition should look like. Certainly, it makes clear that the first repetition should take place soon after initial learning. However, it also indicates that the repetitions to follow can take place at increasingly longer intervals, for each repetition is likely to consolidate the earlier learning so that forgetting will occur more and more slowly (Nation, 2001; Schmitt, 2000).

Suggested memory schedules applying this principle of “expanded rehearsal” (Schmitt, 2000) vary somewhat, but Pimsleur's is commonly cited (Nation, 2001; Schmitt, 2000) and is representative. His schedule utilizes exponential increases whereby if the initial interval between interactions with the target vocabulary is 5 seconds, the following intervals would be  $5^2$  (25 seconds), then  $5^3$  (about 2 minutes),  $5^4$  (about 10 minutes),  $5^5$  (about an hour),  $5^6$  (5 hours),  $5^7$  (about 1 day),  $5^8$  (5 days),  $5^9$  (25 days), etc. While Pimsleur's schedule may seem unwieldy, and as Nation states, “There is no particular reason why the spacing between

the repetitions should be a matter of precise measurement” (p. 77), certainly learners need to be made aware of the principle of “expanded rehearsal.” Materials designers as well need to take it into account as they incorporate probably 10 or more repetitions of any target word into their materials (Webb, 2007a) in order to maximize the benefit students receive. Repetition, however, is only one of the factors that play into learners’ retention of acquired words; another key factor is the depth with which they process target vocabulary and to that we now turn.

### **The role of depth of processing in vocabulary acquisition**

While Craik and Lockhart’s original Depth of Processing hypothesis (1972) has been rejected largely because of its inability to clearly delimit the levels of processing it posited (Laufer & Hulstijn, 2001), educational psychologists have not rejected its core assumption that:

The more attention that is paid to the formal and semantic aspects of words and the richer the associations that are made with existing knowledge (e.g. in the form of establishing similarities and contrasts between old and new information), the higher are the chances that the new information will be retained” (Laufer & Hulstijn, 2001, p. 1).

Laufer and Hulstijn (2001) have endeavored to render this assumption operational via their involvement load hypothesis. The hypothesis states that word retention is based upon the following characteristics of learning tasks: need for the word, defined as absent (-), moderate (+) if externally imposed by a task or teacher, or strong (++) if internally imposed by the learner herself; search, defined as either absent (-) or present (+); and evaluation, defined as absent (-), moderate (+) if involving only the recognition of differences between words or the matching of a provided word to the appropriate gap in a cloze exercise, and strong (++) if requiring the learner to come up with an original text using the target word. Laufer and Hulstijn suggest that a task’s involvement load can be measured in terms of these factors and that the greater a task’s involvement load, the more likely it is to lead to word retention. The explanatory power of the involvement load hypothesis has undergone only limited testing, primarily the post-hoc analyses of previous studies done by Laufer and

Hulstijn in their presentation of the task-induced involvement construct (2001) and two empirical studies specifically designed to test the hypothesis (Hulstijn & Laufer, 2001; Kim, 2008). Nevertheless, these few studies (along with Webb, 2005, though Webb does not invoke the hypothesis) indicate that the involvement load hypothesis is robust. As Laufer and Hulstijn (2001) suggest, it would be valuable to discover whether L2 learners' engagement in tasks with high involvement load can substitute for repetition of target vocabulary, since many L2 learners find adequate repetition difficult to accomplish because of limited access to input and few opportunities for output. The possibility of either fully or partially substituting high involvement load for repetition has not yet been tested, however, so for now it appears that teachers and materials developers should encourage students to engage in high involvement load activities with target words as well as in a reasonable number of spaced repetitions. This is what DAVI, the academic vocabulary learning system tested in this study, aims to do.

Considering the volume of vocabulary academically oriented L2 English learners need to master, however, it is vital that they be enabled to learn independently, since no classroom is likely ever to be able to provide a high enough involvement load and schedule of repetition to support the quantity of vocabulary learning students need to accomplish. Because vocabulary learning must take place at least partially independently, the need for tools students can use to accomplish this independent learning has long been recognized. Not surprisingly, computers have been a key tool of choice and a significant body of research on computer-assisted vocabulary learning now exists. It is this research we will now survey.

### **Computer-Assisted Vocabulary Learning**

Computers have been viewed as a tool for supporting student vocabulary learning almost since the advent of educational software, probably because of their greater potential for providing learners with automatic feedback than a teacher could offer. In addition, the organizational power of computers can be harnessed to reduce the burden on learners or teachers for planning for appropriately spaced repetition of vocabulary (Cobb, 1998).

Computers also provide learners easy access to myriad support materials such as online dictionaries and corpora.<sup>1</sup>

Yet these support materials vary in their usefulness. For example, many studies attempting to provide students with contextualized target vocabulary via online corpora or Internet sources have found that the texts making up the corpora were too difficult for their concordance lines to be comprehensible to intermediate learners (Horst, et al., 2005; Cobb, 1998.) Yet learner use of corpora can be valuable.

Assuming learners are concordancing a corpus of texts consisting of 95-98% comprehensible input, research so far has demonstrated that several characteristics of corpora are uniquely suited to facilitating learners' vocabulary acquisition. For one thing, corpora, unlike coherent texts, tend to present target words in both a variety of contexts and a variety of situations of use, which the incremental vocabulary acquisition research indicates is exactly what learners need to get beyond a fuzzy, general understanding of a word's meaning to a clear grasp of its semantic boundaries (Cobb, 1998). For another, broken concordance lines can facilitate students' vocabulary acquisition, because while learners may not notice unfamiliar vocabulary when reading because they are able to follow the story-line or key ideas of a text without it (Nation, 2001; Cobb, 1998), broken concordance lines prevent them from getting so caught up in a text, they get distracted from the target vocabulary. Concordancing has other benefits as well for learners, for Cobb (1998) found that "[students] searching through a corpus for clear examples of new words produced both definitional knowledge and a transfer of comprehension to novel texts, both short and long term" (p. 352), whereas dictionary-aided word-list learning gave students only definitional knowledge of the target vocabulary and only for the short-term.

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<sup>1</sup> A corpus is a principled collection of texts compiled for research or pedagogical purposes. Often the principle behind the development of a corpus is that it be representative of one or more text types of interest (e.g. textbook text or TV news transcripts). Corpora are searched by means of concordancers, tools which locate all instances of the desired word, phrase, grammar structure, etc. found in a given corpus.

## Summary

The literature examined here provides specific guidance to materials designers and teachers seeking to support learners in their vocabulary acquisition, and as chapter 3 will make clear, it guided the way in which I developed DAVI. To summarize the research findings, learners should be directed to an initial focus on acquiring GSL vocabulary and then AWL vocabulary, but not on individual words from these lists alone. Learners also need to become familiar with the lexical chunks using GSL and AWL words, a fact that requires them to be contextualized.

To facilitate learners accurately guessing a target word's meaning from context, their initial encounter with the vocabulary to be learned should probably be in a pedagogical or directive context, but to clarify their understanding of the semantic boundaries of the target word, their later encounters with it should be in a variety of contexts and situations of use excluding misdirective contexts until after the learner has gained a solid understanding of the word's meaning. In all cases, it is probably best that the contexts be made up of 95-98% known words so students can learn from the contexts even incidentally as they read over them quickly.

It is also important that learners *notice* the vocabulary and associated lexical chunks to be learned. Two means commonly used to facilitate noticing are textual enhancement (e.g. bold and italic font) and repetition. Learners should encounter the word probably a minimum of 10 times and at least some of these encounters should be spaced in a way that allows "expanded rehearsal." Finally, students should be helped to process the vocabulary deeply via high "involvement load" interactions with it.

While the number of issues that materials designers and teachers must take into account as they attempt to help learners acquire needed vocabulary can seem daunting, the creation of a computer curriculum fulfilling the above requirements has potential for enabling students to rapidly acquire the vocabulary they need to successfully study content in their L2--and to enable them to acquire that vocabulary largely independently. The next chapter describes the vocabulary learning system I created to meet these requirements as well as the materials and method used to determine the usability of that system.

## CHAPTER 3. MATERIALS AND METHOD

### Overview of the Study

The literature reviewed in the last chapter is the theoretical foundation underlying the academic vocabulary learning system I created called DAVI (Developing Academic Vocabulary Independently; pronounced “Davy”). I designed DAVI to help L2 English learners who already have a good grasp of GSL vocabulary to acquire AWL vocabulary both receptively and productively and to do so largely independently. Nevertheless, DAVI’S foundation in key vocabulary acquisition research findings does not guarantee its usability. For many L2 English students, the learning methods used in DAVI are likely to be mostly unfamiliar and thus the possibility that the system will lack face validity for them is significant. If students dislike using DAVI or are convinced it will not help them learn what they need, the system will need to be abandoned, or, since it *is* theoretically well-grounded, revised. To determine whether and how DAVI should be further developed, I undertook the three-and-a-half week-long usability study conducted during fall 2009 that this chapter describes.

### Participants

Participants in this usability study were students in my high-intermediate reading class studying in the Intensive English and Orientation Program (IEOP) of Iowa State University in fall 2009 who were preparing to pass TOEFL (Test of English as a Foreign Language) and begin regular academic classes at U.S. universities. More than 90% of the approximately 240 IEOP students at the time of the study were Chinese; thus, all participants in the study were from China. Participants were between 18 and 20 years of age. During the data collection process, I recorded data from and about the ten students who had given their informed consent to participate in the study. During the data analysis process, however, I realized I could best determine the answer to my research questions and thus the usability of DAVI, by primarily focusing on the three students who, for the most part, had completed their DAVI work as assigned and were at the appropriate level of vocabulary



development. As can be seen in Table 3.1, these three students, Andrew, Phil, and Tina,<sup>2</sup> had submitted 10 DAVI uploads to our course website. I considered counting Rena who had submitted 9 DAVI uploads as a focal student as well, but when I reviewed her score from the Vocabulary Levels Test (VLT) (Schmitt, Schmitt, & Clapham, 2000) administered to IEOP students at the beginning of the semester, I realized it indicates she lacked knowledge of approximately 300 GSL words, too many for her to be prepared to begin AWL study (Nation, n.d.). In contrast, the VLT scores for Andrew, Phil, and Tina indicate they lacked knowledge of only between 33 and 133 GSL words, a much more reasonable number to pick up incidentally while focusing on AWL vocabulary acquisition. Thus, these three students fit the profile of the students for whom DAVI was designed: learners who had a solid grasp of GSL vocabulary and were ready to begin intentional focus on AWL acquisition. Data from Elise and Kara who uploaded 5 and 2 DAVI assignments respectively will also be included in this paper, but only where their data clarify or develop that gathered from Andrew, Phil, and Tina.

### Location

DAVI was designed as a system for facilitating students' independent academic vocabulary acquisition (Developing Academic Vocabulary Independently), so location of use was not a factor controlled in this usability study, except during the class meetings when DAVI was introduced and on weekly computer lab days.<sup>3</sup>

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<sup>2</sup> All student names used in this paper are pseudonyms.

<sup>3</sup> Time-on-task was similarly uncontrolled because outside the DAVI introduction days and weekly lab days, students completed all DAVI assignments as homework. Learners' completion of these assignments when lacking immediate access to me as their teacher allowed me to see how their independent use of DAVI affected their vocabulary acquisition and thus to answer my second research question, namely, "How are the ways in which learners completed one or more of the tasks in DAVI likely to have affected their academic vocabulary acquisition?"

Table 3.1 Usability study's participant data

	Andrew	Phil	Tina	Rena	Elise	Jen	Shawna	Kara	Liam	Jeff
<b># of uploaded DAVI assignments</b>	10	10	10	9	5	4	3	2	2	0
<b>Vocabulary Levels Test (VLT) scores</b>										
2k level (out of 30)	29	28	26	21	23	26	26	23	25	25
AWL level (out of 30)	19	17	8	11	19	17	18	13	15	14
<b>Implications of VLT scores</b>										
approximate # of unknown words on 1001-2000 list	33	67	133	300	233	133	133	233	167	167
approximate # of unknown word families on AWL	209	247	418	361	209	247	228	323	285	304

Students were introduced to DAVI in the IEOP computer lab, a lab offering 20 Apple computers installed with a variety of software, including Microsoft Office, and connected to the World Wide Web via the Iowa State University network. The computers are situated on 5 rows of long tables, 4 computers per row. At the back of the classroom is a teacher's desk having an Apple computer that can connect to a projector for display on a screen at the front of the lab where there is a whiteboard. This lab was not only used for the introduction to DAVI, but also for the weekly computer lab day the two weeks following DAVI's introduction.

The computer lab day the third week of the study was held in Iowa State's CALL (Computer-Assisted Language Learning) Research Lab because of its computers' capacity for screen capture via Camtasia Studio software (2009). The CALL Research Lab is equipped with 16 PC computers situated on tables abutting basically three of the four walls. The fourth wall is equipped with a whiteboard and projector screen and the lab monitor's computer connects to the projector.

### **Materials: DAVI**

DAVI (Figure 2), which stands for Developing-Academic-Vocabulary-Independently, is designed to enable L2 English learners to efficiently acquire rich knowledge of the highly frequent AWL vocabulary. As shown in Figure 2, each week's tab in DAVI consists of a column for each day that contains vocabulary study pages for 10 AWL words. In accord with the second language vocabulary acquisition research, DAVI first places target words in three largely pedagogical or directive contexts containing only GSL vocabulary, previously studied AWL vocabulary, proper nouns, and a few other words students can reasonably be expected to know (e.g. kids). Both the target words and their collocates are made salient via textual enhancement. The learning tasks require students to engage in both moderate and strong involvement load interactions for each target word spaced according to a schedule providing "expanded rehearsal." DAVI was created in Microsoft Excel, so students could use it not only for independently studying AWL vocabulary but also as a template for

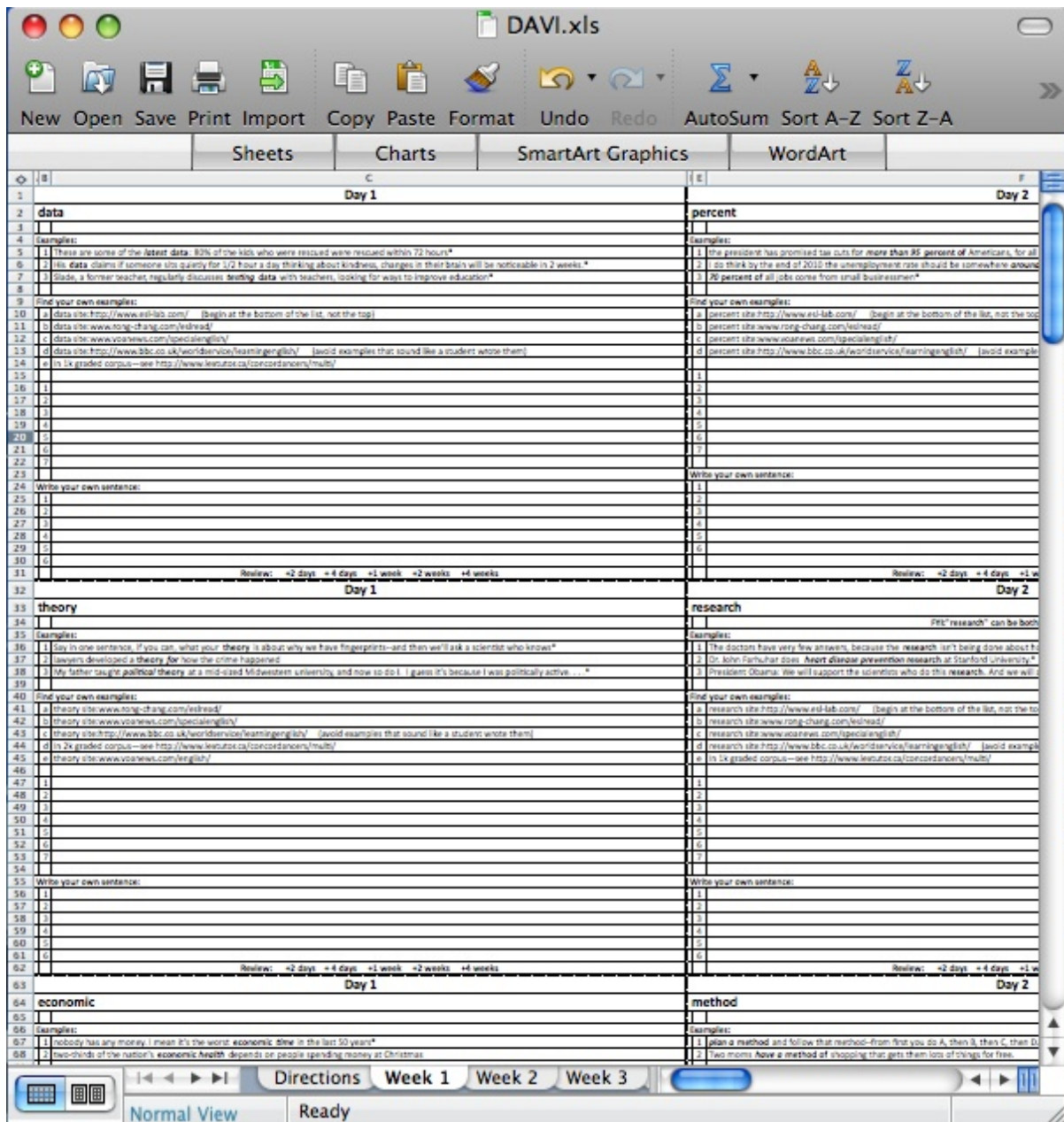


Figure 2. DAVI's structure. Each week's tab in DAVI consists of a column for each day that contains vocabulary study pages for 10 AWL words.

creating their own vocabulary study system with target words they self-identified as important to learn.

Students were introduced to DAVI and how they could expect it to help their academic vocabulary acquisition primarily by means of the introduction to DAVI included in

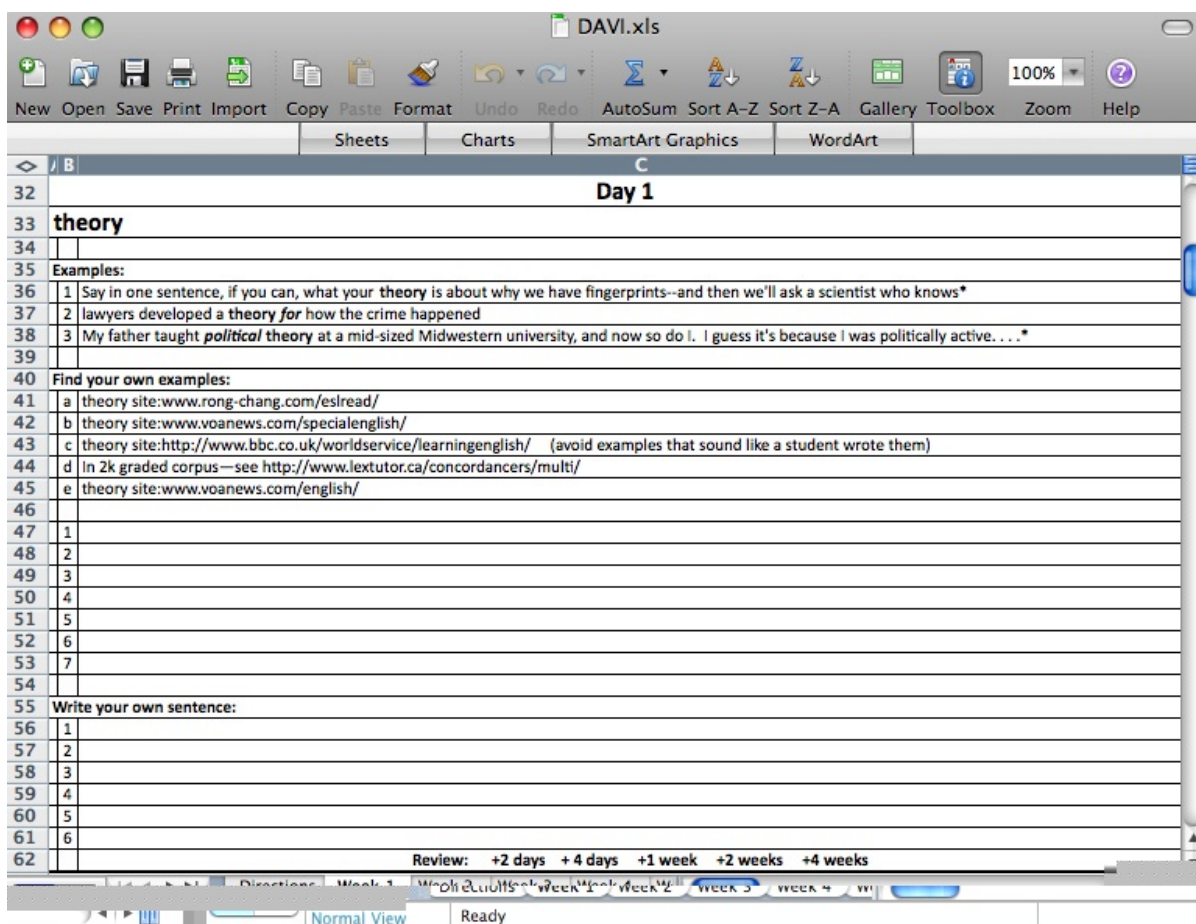


Figure 3. A complete vocabulary study page containing 3 provided examples and several “Find your own examples” sources.

the informed consent document that they read the first day of the study. This DAVI introduction material is pasted below:

### What is DAVI:

DAVI is an experimental vocabulary-learning system. This means that research has **not** already proved that DAVI can help students learn vocabulary. But research has given us a lot of information about how people learn new vocabulary. DAVI’s designer used this information to make DAVI. DAVI should help you learn more academic vocabulary because it will help you think deeply about each word, review each word several times, and for many of the words, learn one or more common phrases that use the word. From DAVI, you will also learn good websites that can help you improve your English and you will also learn a new way to learn vocabulary.

### **DAVI's structure**

Each day's column consists of ten vocabulary study "pages," each of which has the day (e.g. Day 11) centered at the top. Beneath the day on each vocabulary study page is the target word, left-justified, e.g. "theory" in Figure 3 above. All target words are the most frequent words within their word families, according to a list of the most frequent AWL words available at Victoria University of Wellington's website (2009). While in terms of lexical chunk acquisition, it might benefit students to devote special attention to many of the inflected and derivational forms individually within a given word family, as different forms can collocate (or "chunk") quite differently from one another (Kennedy, 2008), this is probably not necessary if students have acquired the relevant affixes and if their primary need is to understand the target vocabulary and its collocations receptively<sup>4</sup> rather than to produce it (cf. Nation, 2001; Schmitt, 2000). Because I assumed that most students would believe vocabulary mastery equates to receptive understanding and thus would feel that focusing their attention on multiple affixed forms within a given AWL word family was not worth the time or effort, I included in DAVI only the most frequent word of each family.

DAVI provided learners with 5 complete vocabulary study pages per day, of which they were to choose three to complete. As figure 3 above pictures, the study pages provide three example sentences and list several "Find your own example" sources.

### **Provided example sentences**

The complete study pages include three example sentences for each target word. The object is to promote learners' acquisition not only of the word itself, but also of the lexical chunks within which it can be embedded. All provided example sentences in DAVI are either authentic or adapted contexts from Mark Davies' *Corpus of Contemporary American English* (COCA).<sup>5</sup>

Multiple examples of the target word in use were provided in DAVI because repetition of an item is one way to make it salient and thus to promote noticing. Another

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<sup>4</sup> This is because most collocations are compositional, not idiomatic.

<sup>5</sup> For an extended discussion of the criteria used to isolate and adapt contexts from COCA which would be comprehensible to students, see the Appendix.

means of increasing the salience of material to be learned is via textual enhancement.

Textual enhancement was applied in DAVI, not only to the AWL vocabulary proper, but also to associated lexical chunks within which the vocabulary was embedded. Two kinds of textual enhancement were used.

Fixed phrases were marked in bold, as in the following:

- "The happiest people work in the **administration of** the government."
- In 1843, London established a system of government in Hong Kong involving British **administration of** Hong Kong's large Chinese majority
- if I neglect the teachers of those kids or the **administration of** the school, it is bad because they all influence how successful the kids are going to be\*<sup>6</sup>

Variable phrases and variable parts of phrases were marked in bold italics:

- things are very different today than they were before. Now you cannot **conduct business** without a cell phone.\*
- we cannot lose the opportunity to **conduct research** that would give hope to those suffering from terrible diseases\*
- Each week in July, students will **conduct experiments** to gather research data.\*

Sometimes a target word was embedded in multiple phrases, meaning that phrasal constituents weren't always adjacent, as is the case for "need assistance" and "provide assistance" in Figure 4 below. In these cases, as figure 4 shows, potentially unclear phrases were listed in the upper right-hand corner of the relevant vocabulary study page.<sup>7</sup>

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<sup>6</sup> Examples with an asterisk following them were adapted from COCA; examples without an asterisk are direct quotes.

<sup>7</sup> A complicating factor in the textual enhancement of provided examples was that it is not always easy clearly to delimit what is or is not a variable phrase (Handl, 2008). In DAVI, I tried to avoid enhancing so much of an example that the salience of the target word and its primary associates became lost. This meant, for example, that I generally avoided enhancing objects of prepositions as can be seen in provided examples for the AWL word "involved":

- They knew she was on Gardner Road, but only one of the 19 **officers involved in** the operation knew where that was.
- U.S. Airways flight 1459 was **involved in** an accident. 150 passengers were on board, but reports say everyone got off safely.\*

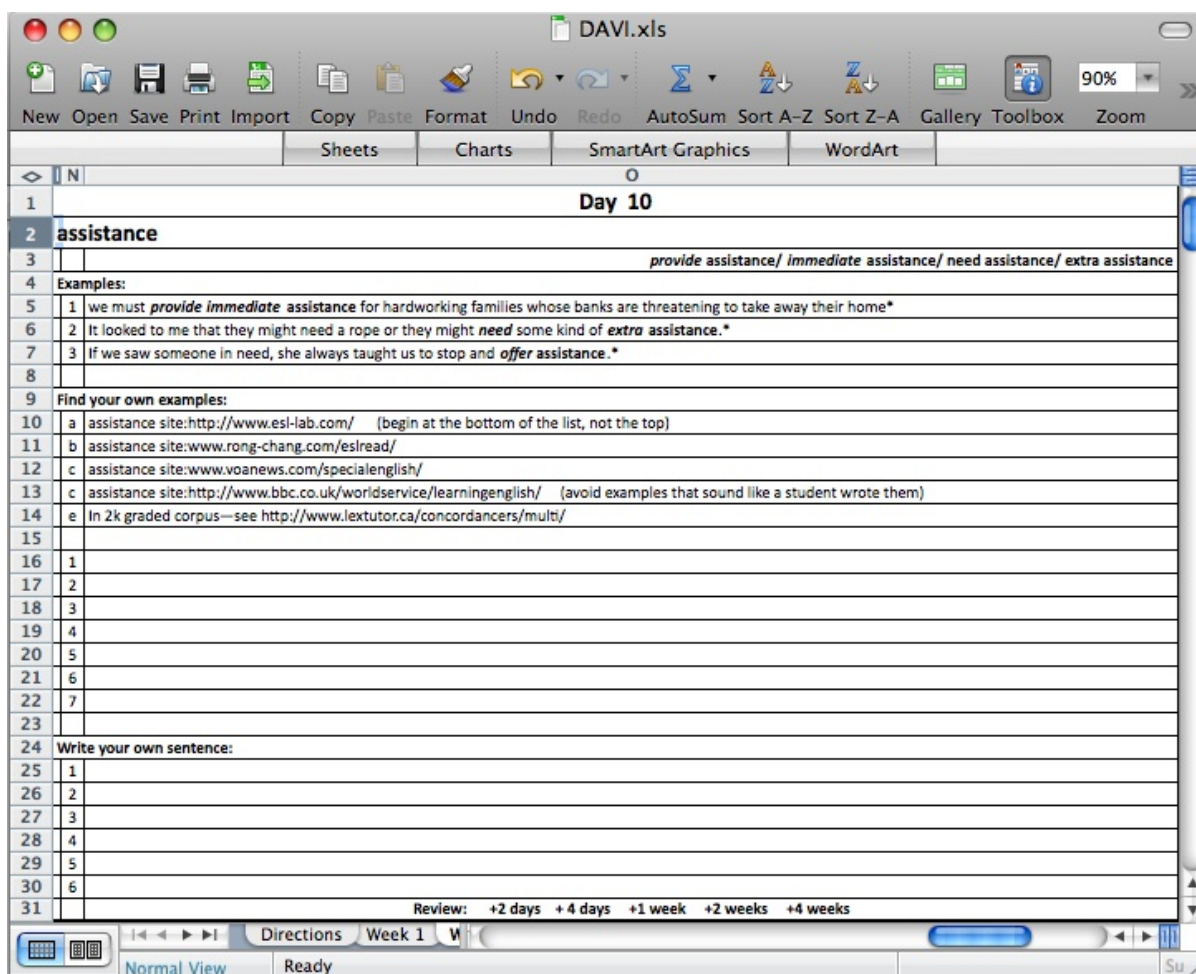


Figure 4. Non-adjacent (or otherwise potentially confusing) phrasal constituents are listed in the upper right-hand corner of vocabulary study pages.

As the foregoing makes clear, provided examples in DAVI are designed to give students a solid foundation not only in understanding a target word, but also in noticing it and the lexical chunks of which it is likely to be a part as something to be learned. The examples are also designed to provide the first repetitions of target vocabulary that the research has demonstrated are so valuable for acquisition. In addition, in conjunction with the contexts students locate when they find their own examples, the provided examples are intended to support learners' incidental acquisition of target vocabulary as they read quickly through them on the various target words' review days.



### **The “Find your own examples” source list**

This leads us to the next aspect of DAVI’s structure: the “Find your own examples” source list on complete vocabulary study pages. During DAVI’s design process, word-specific “Find your own example” source lists for the different target words were prepared to enable students, via site-specific Google searches, easily to locate their own examples of target words in use within ESL or ESL-friendly websites such as Randall’s ESL Cyber Listening Lab (<http://www.esl-lab.com/>), Ron Chang Lee’s ESL short story site ([www.rongchang.com/eslread/](http://www.rongchang.com/eslread/)); BBC’s Learning English (<http://www.bbc.co.uk/worldservice/learningenglish/>); Voice of America ([www.voanews.com/english/](http://www.voanews.com/english/)), and Voice of America, special English ([www.voanews.com/specialenglish/](http://www.voanews.com/specialenglish/)).<sup>8</sup>

As can be seen in Figure 4, presented above, immediately under the lists of “Find your own examples” sources are 7 lines where learners can paste or type examples of the target word they have found. Directly beneath that are 6 lines where learners can type their own sentences using the target word. At the bottom of each vocabulary study page is a review day reminder designed to guide students to engage in expanded rehearsal of each target word (Schmitt, 2000) according to the schedule in Figure 5 below.

With an understanding of DAVI’s structure, we can now turn to how DAVI is designed to be used. We will do this by going step-by-step through the directions given students<sup>9</sup> for using DAVI, following each step with a discussion of its research foundation and rationale.

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<sup>8</sup> Because one goal of DAVI is that it teach students a method they can use for learning words beyond the AWL, small sites such as the California Distance Learning Project’s Adult Learning Activities site (<http://cdlponline.org>), though excellent resources for intermediate learners in other respects, were not included because they contain few AWL words and it was assumed, would also contain few other post-GSL words students could be expected to be interested in learning.

<sup>9</sup> Via hard copy the first day of the study as well as within the DAVI document itself on the “Directions” tab.

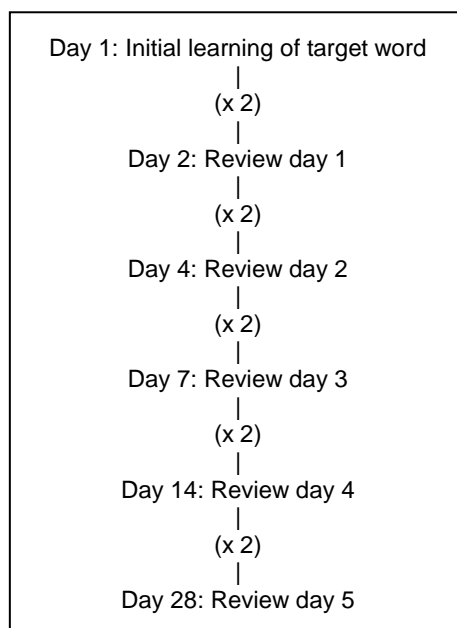


Figure 5. Review day schedule for DAVI applying the principle of expanded rehearsal.

## How to Use DAVI

### Step 1

*Read the sentences/phrases under "Examples" on today's first vocabulary sheet. Can you easily understand the examples? (If you don't know a word in them, *first* try to guess its meaning from the context. If you can't guess it, *then* check your dictionary.)*

This step is designed to give students three encounters with the target word in contexts conducive to their accurately guessing the word's meaning and thus to train them to use the context of an unfamiliar word as their "first stop" in their pursuit of its meaning.

### Step 2

Use a "Find your own examples" search option to *do a Google or corpus search. Find 1-3 **easy-to-understand** examples.* Paste these examples onto the vocabulary sheet.

Later in the directions, it specifies:

Some vocabulary words have more than one meaning. When you "Find your own examples," your examples should use the word in the same way as the "Examples" sentences/phrases. It's important to try to learn only one meaning at a time.

Step 2 has several purposes. First, to identify an example appropriate for pasting onto the target word's vocabulary study page, students will need to read at least one and probably more of the results provided from their Google search, as can be seen in the sample search results pictured in Figure 6 below for the AWL word "involved" on Ron Chang Lee's ESL short story site. This fulfills well what Horst et al. (2005) specify as an important characteristic of computer-based vocabulary learning tools: "Ideally, computerized review activities would offer opportunities for expansion by presenting and testing target words in ever new contexts (p. 92)."

Step 2 has an additional purpose—the purpose of increasing students' "involvement load" (Laufer & Hulstijn, 2001) in their interaction with target vocabulary. According to Laufer and Hulstijn's model, the involvement load required by DAVI in connection to the "need" factor is only moderate, since students' needed to use the system during this study for 3 words per day. However, in that step 2 requires learners to evaluate examples they find in terms of their comprehensibility and in connection to whether they use the target word with the same meaning as the provided examples, it increases the involvement load in DAVI tasks by an additional "moderate" evaluation factor.

### Step 3

*Compare your example(s) to the sentences/phrases under "Examples." Mark any fixed phrases or fixed parts of variable phrases from your examples in **bold**. Mark any variable parts of variable phrases from your examples in **bold italics**.*

Step 3 requires the involvement load factor of moderate evaluation in a different form. Learners are asked to apply the same kind of textual enhancements to their examples as those used in the provided examples. Without native speaker intuition, learners are likely to have only limited ability to identify whether parts of phrases are fixed or variable subjectively,

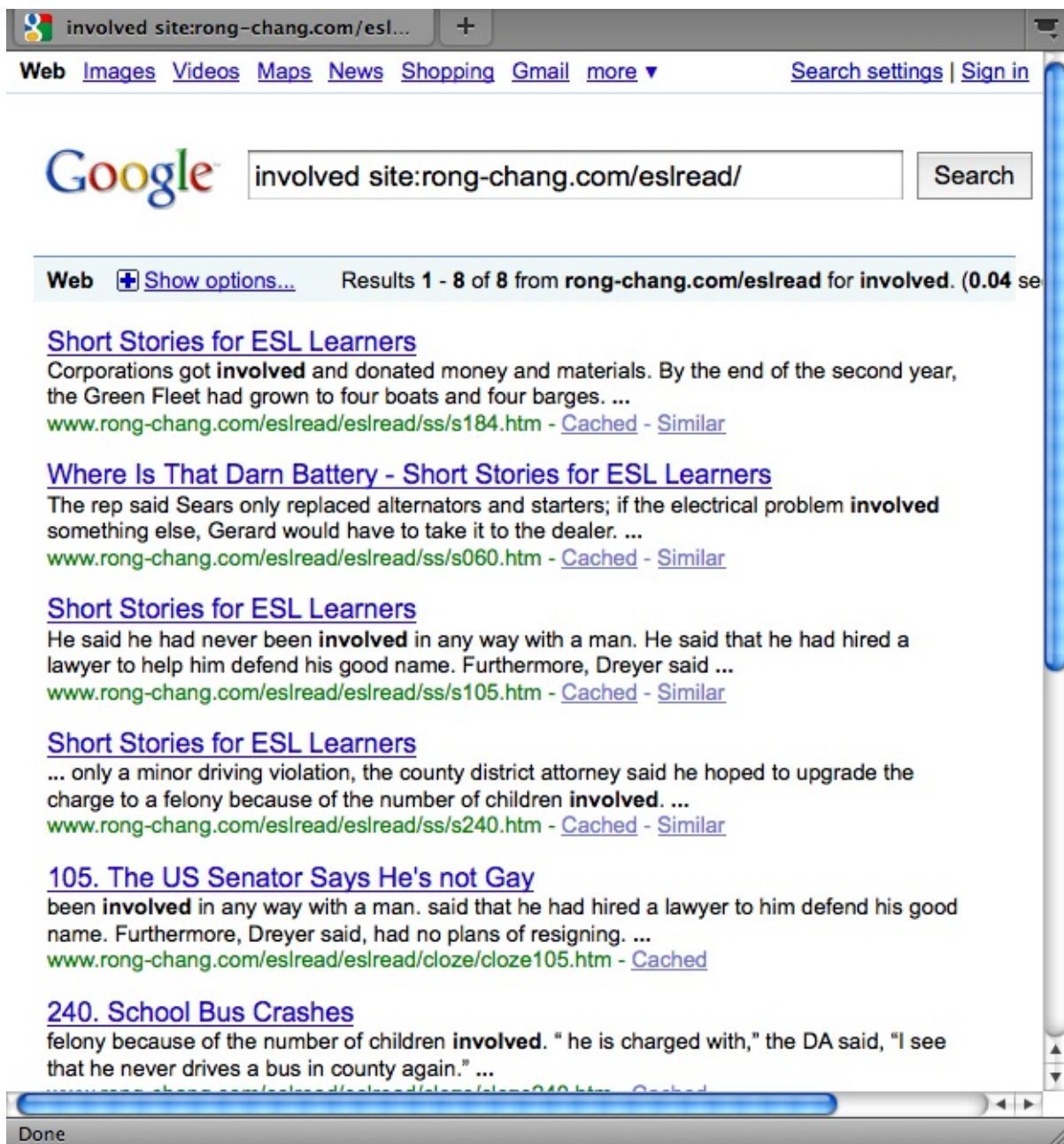


Figure 6. Google results for a search for the AWL word “involved” inside Ron Chang Lee's short story site.

thus the step 3 directions guide learners to identify the fixed or variable status of phrasal constituents solely on the basis of whether they recur in the provided examples or their own examples (in a lexically identical form for “fixed” phrases; in a lexically different but

grammatically identical form for “variable” phrases).<sup>10</sup> Thus, in the first set of contexts from step 1, the recurrent form “administration of” is marked as fixed:

- "The happiest people work in the **administration of** the government."
- In 1843, London established a system of government in Hong Kong involving British **administration of** Hong Kong's large Chinese majority
- if I neglect the teachers of those kids or the **administration of** the school, it is bad because they all influence how successful the kids are going to be\*

The nonrecurrent direct objects of the verb “conduct,” however, are marked as variable:

- things are very different today than they were before. Now you cannot **conduct business** without a cell phone.\*
- we cannot lose the opportunity to **conduct research** that would give hope to those suffering from terrible diseases\*
- Each week in July, students will **conduct experiments** to gather research data.\*

Specific guidance was provided for marking verbs and direct objects, because as Kennedy (2008) states, referencing Sinclair’s research, “Frequently occurring words predict better to the right than to the left [of verbs in English].” We can see what he meant if we consider a sentence like “Tanya analyzed the data carefully.” Given the verb “analyzed,” it is not difficult to predict what is on the right of the verb, the direct object “data,” for there are only a small set of possible logical direct objects. It is much more difficult to predict what is to the left of the verb, in this case the subject “Tanya,” for the subject could logically be one of any number of names, job titles, machines, etc. Because only a limited set of direct

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<sup>10</sup> Undoubtedly, defining fixed and variable “chunks” this way will sometimes result in learners’ highlighting phrases whose status as a unit is questionable, since the combination of words they contain is not merely compositional but also infrequent in the language generally. This is probably inevitable for any system which puts the learner in the driver’s seat when it comes to identifying and tagging lexical chunks. As Wible (2007) points out, a phrase can very clearly be a “chunk” in one case and just as clearly not in another (e.g. “*the matter* in *What’s the matter with him?* but not in *They discussed the matter with him.*” [pp.174-175]). It can hardly be expected that learners will be able to separate the two with perfect accuracy, but I believe the benefit of students becoming increasingly conscious of lexical chunks and of patterns they tend to have far outweighs the risk of their acquiring and then overusing some unusual word combination they’ve textually enhanced in examples they’ve found.

objects tends to be acceptable with any given verb, it is important that learners acquire verbs in connection to some of their frequent direct objects.<sup>11</sup> As a result of this principle, students were given the following directions:

If the word you're studying is *a verb*, mark its direct object in ***bold italics***:

- things are very different today than they were before. Now you cannot ***conduct business*** without a cell phone.\*
- we cannot lose the opportunity to ***conduct research*** that would give hope to those suffering from terrible diseases\*
- Each week in July, students will ***conduct experiments*** to gather research data.\*

If the word is *a direct object*, mark its verb in ***bold italics*** like in the examples below.

- It looked to me that they might need a rope or they might ***need*** extra ***assistance***.\*
- If we saw someone in need, she always taught us to stop and ***offer*** ***assistance***.\*
- we must ***provide*** immediate ***assistance*** for hardworking families whose banks are threatening to take away their home\*

The reason for these directions was explained as follows:

Many verbs take a small set of direct objects (“conduct” can take {business, research, experiments}, but not {education, situations, dogs}). It's good to learn which verbs and direct objects are often together. Then you will be able to use them correctly in your speaking and writing.

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<sup>11</sup> The possible direct objects of a verb tend to share semantic features, so it is probably unnecessary for learners to attempt to master all members or even all the key members of the set of nouns which could be logical direct objects of a given verb. For example, logical direct objects of the verb “analyze” tend to have a core meaning of “information,” e.g. “analyze the data,” “analyze the evidence,” “analyze the input,” etc. By learning a few of these verb-direct object collocations, learners are likely to develop a sense of the word’s semantic features and to realize that “analyze the orange juice” is probably not standard English.

In addition, the directions aimed to prevent learners from textually enhancing so much, they would be unable to notice the most important collocates of a target word. This was attempted via the following guidelines:

*Don't mark articles ("a," "an," or "the"), pronouns (e.g. "it" in "achieve it" [below]), or "to" before a verb (e.g. the "to" in "to achieve" [below]). It's okay if you can't find any phrase in your examples. Just mark the word itself in bold. You might find a phrase later when you add more examples.*

The following examples were provided to demonstrate the application of these guidelines. Notice "a" is unenhanced in the first example:

- lawyers developed a **theory** *for* how the crime happened
- he demanded victory and his soldiers did everything in their power to **achieve** it for him

#### Step 4

*Write your own sentence using the word. Try to use the word in one of the fixed or variable phrases you marked in bold or bold italics. That will help you remember the phrase.*

Step 3 requires only moderate evaluation according to Laufer and Hulstijn's (2001) involvement load hypothesis, because it merely requires students to identify whether a Google or corpus context is comprehensible and whether it uses the target word in the same way as the provided examples. Step 4, on the other hand, requires students to engage in strong evaluation as it asks them to make "a decision about additional words which will combine with the new word [or chunk!] in an original sentence or text" (p. 15). Coxhead (2008) uses similar text-generation assignments around target collocations in the English-for-Academic-Purposes classes she teaches, but she clarifies that the phraseology research is not yet at a point where we can be sure such techniques are effective.

Nevertheless, regarding the target word itself, the cumulative demands of steps 1-4 mean that on each day the learner reviews the word, he or she will encounter it at least 5 times (in their reading of the three example sentences, in their identification of a "Find your

own example” sentence, and in their generation of a context that can surround the target word or a fixed or variable phrase that contains it. Even if learners skip steps (e.g. not reading the provided examples on a target word’s review days), because five review days for each target word are built into DAVI’s structure, learners will still encounter the word at least ten times. Because Webb’s (2007a) research indicates that at least up to ten repetitions, repetition of target words in context can continue to produce measurable gains in word knowledge, this is a valuable design feature of DAVI.

### Step 5

*Cut and paste the vocabulary sheet under the next review day's vocabulary sheets. Don't forget to delete that review day from the "Review" list!*

The goal of this step is to enable learners to engage in “expanded rehearsal” (Schmitt, 2000) as discussed in the repetition segment of the literature review. The review list referred to in the directions for step 5 is the review day reminder at the bottom of each vocabulary study page that looks like this:

Review:    +2 days    + 4 days    +1 week    +2 weeks    +4 weeks

### Step 6

*Save your DAVI file. Go to the Moodle website for our class (<http://courses.isucomm.iastate.edu>). Then log in. Upload your DAVI file to today's forum. You're done for today!*

Step 6 is obviously not necessary for students’ independent use of DAVI, but it provided a means of accountability for students and a source of motivation for them to complete their DAVI homework. Students’ DAVI uploads also provided valuable insight for me into what aspects of DAVI worked and didn’t work.



Table 3.2 Pre-Study and During-Study Data Collection

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Before the study	Participants took a beginning-of-the-semester Vocabulary Levels Test in accord with IEOP policy
DAVI introduction days	<p>After each introduction day, I typed up field notes on everything that had occurred in class relevant to the research questions</p> <p>Students submitted DAVI assignment uploads in class</p> <p>I prepared individual feedback for students on 2 DAVI uploads</p>
“Independent use” days	<p>On non-lab days, students uploaded DAVI assignments as homework</p> <p>On lab days, students uploaded DAVI assignments in class</p> <p>I prepared individual feedback for students on 5 DAVI uploads</p> <p>On the third week’s lab day, screen-capture software video-recorded everything learners did on screen</p> <p>I questioned students who arrived early to class about their affective response to DAVI and related questions, taking notes in the case of the one student, Kara, who had given informed consent to participate in the study</p>
End-of-Study days	<p>Students completed End-of-Study Questionnaire</p> <p>I prepared individual follow-up questions based on questionnaires and asked them before or after class, taking notes on participants’ answers</p> <p>I prepared additional questions based on the follow-up responses of some participants and asked them before or after class, taking notes on participants’ answers</p>

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## Procedures

Several kinds of data were collected and analyzed in this study as can be seen in Tables 3.2 and 3.3. Following the tables is a description of these data.

Table 3.3 Post-Study Data Collection and Data Analysis Processes

Identifying focal participants	<p>I checked the number of DAVI assignment uploads for all students providing informed consent</p> <p>I narrowed focal participant pool to four students who had submitted either 10 or 9 DAVI uploads: Andrew, Phil, Tina, and Rena</p> <p>I checked Vocabulary Levels Test scores for these 4 students and narrowed the focal participant pool to students whose scores indicated they were ready to shift from intentional GSL study to intentional AWL study: Andrew, Phil, and Tina</p>
Data collection	<p>I watched the two focal participant screen capture recordings I had (Andrew's and Tina's), taking notes on everything they had done on-screen relevant to the research questions</p> <p>I compiled all feedback I had provided participants over the course of the semester in a single document.</p>
Data analysis	<p>I read through all compiled feedback, looking for cross-participant patterns.</p> <p>I examined 75%+ of focal participants' DAVI homework uploads and one or more uploads from all other students who had given their informed consent to participate in the study,<sup>12</sup> primarily looking for cross-participant patterns but also noting intra-participant patterns</p> <p>During my examination of uploads, I pasted many of students' "Find your own examples" entries and suspiciously proficient "Write your own sentence" entries into Google in order to identify their sources</p> <p>I read through all field notes and screen-capture notes, highlighting anything relevant to the research questions</p>

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<sup>12</sup> Between the uploads evaluated for the purpose of giving feedback to students and those evaluated specifically for this study, I examined more than 30 total uploads from at least 10 of the 14 days of the study, looking for patterns in how students interacted with DAVI. Because the uploads usually contained previous days' work in addition to that from the upload day proper, I sometimes chose to examine several days of work within a single upload to identify intra-participant patterns of DAVI use.

The 2,000 word level	
1 birth	
2 dust	_____ game
3 operation	_____ winning
4 row	_____ being born
5 sport	
6 victory	
1 choice	
2 crop	_____ heat
3 flesh	_____ meat
4 salary	_____ money paid regularly for doing a job
5 secret	
6 temperature	
Academic Vocabulary	
1 benefit	
2 labour	_____ work
3 percent	_____ part of 100
4 principle	_____ general idea used to guide one's actions
5 source	
6 survey	
1 element	
2 fund	_____ money for a special purpose
3 layer	_____ skilled way of doing something
4 philosophy	_____ study of the meaning of life
5 proportion	
6 technique	

Figure 7. The first 6 of 30 questions for the 2k and AWL lists from Schmitt, Schmitt, and Clapham's (2000) Vocabulary Levels Test, Version A

### Vocabulary Levels Test

As mentioned in passing in the participants segment of this chapter, all IEOP students take the Vocabulary Levels Test at the beginning of each semester (Schmitt, Schmitt, & Clapham, 2000), excerpts of which can be seen in Figure 7. The data collection and data analysis aspects of the Vocabulary Levels Test (VLT) in this study are described in Tables 3.1 and 3.2. The use to which the VLT data thus collected and analyzed were put was to determine the degree to which students fit the profile for which DAVI had been designed: namely those who have a good grasp of GSL vocabulary but have not yet mastered AWL

vocabulary. Students' differing VLT scores also provided a means of interpreting their differing responses to DAVI.

### **Field notes from the introduction days**

Following the four 50-minute DAVI introduction days, I typed up field notes on everything I could remember that I had observed or that students had said relevant to the research questions. An excerpt from my notes on the first introduction day is below:

Students had trouble with the Google search directions. Many of them opened the actual sites (perhaps not even using Google to find them) rather than using the provided search info. . . . One student pasted the web address for the sentence/phrase she understood into DAVI's "Find your own examples" rather than the sentence/phrase itself. By the end of class (which ran over time) I think all the students had found at least one example sentence for the first word (data), either with or without my help. I had them save DAVI and email it to themselves and told them that their homework was to find at least one example sentence for 3 of today's words and write at least one of their own sentences for it as well.

### **Participants' DAVI uploads and my upload feedback**

Once students had been introduced to DAVI, they were required to complete and upload DAVI work almost every weekday of the study (see Figure 8 for an example). Following its initial introduction, students used the DAVI system for homework 4 days per week for a little more than three weeks, doing assignments such as textbook reading and exercises during class time. Assessment of student uploads for this study was accomplished both by review of feedback I had given students on their DAVI uploads<sup>13</sup> and by examination of uploads themselves specifically for the purpose of data collection. An example of feedback I wrote regarding a student's upload is the following:

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<sup>13</sup> Though initial plans were for students to use DAVI independently following the introduction days, it became clear during the study that students would require additional help to use DAVI in accord with its design, help which I provided in the form of individual feedback.

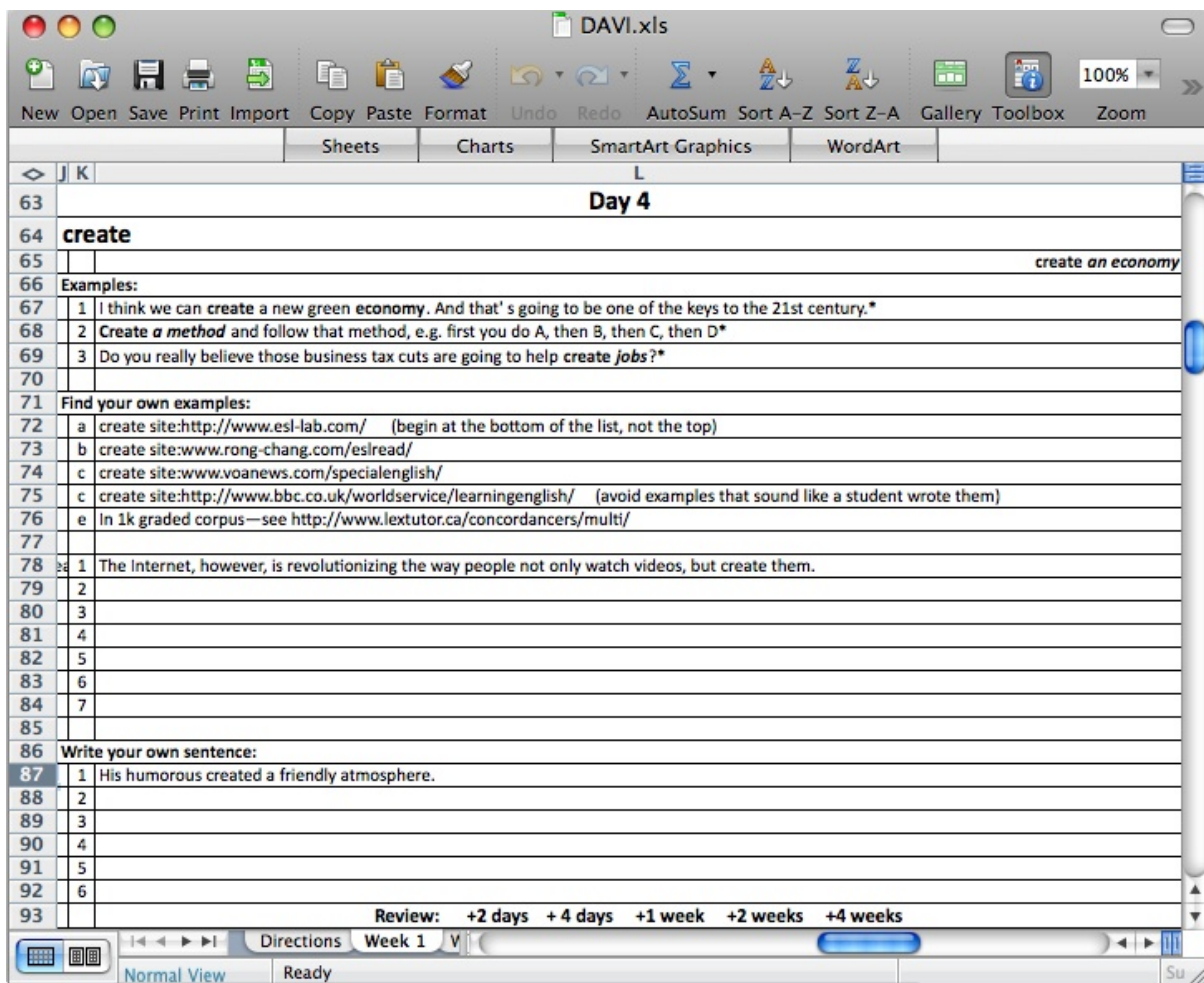


Figure 8. One vocabulary study page from Phil's DAVI uploads.

Txxx,

Great examples and sentences! However, you need to look at the directions under 3) . . . Variable Phrases. Many of your phrases should actually be marked like this:

- **Data centers** are buildings full of servers.
- A **data processor** enters numbers and other information in to a computer.
- The **Education Sector** report calls for more study into the differences

Also, where are days 1-4?

Monica

## Screen capture

As mentioned earlier, screen capture was done on students' computers the lab day of the third week. Unfortunately, many students failed to follow my directions not to restart their computers at the end of the session. This meant I was able to collect screen capture data for only three students, including two of the focal students, Andrew and Tina. I reviewed their screen capture recordings, taking careful notes on how each interacted with DAVI. Below is an excerpt from my notes on Tina's screen capture recording:

Arrived @ Day 11 @ 26:12 & stays for 30 seconds

Begins working on Day 11 (should have been day 12), but goes to G drive rather than to Internet, has a little trouble figuring out how can open a new window for Internet window

Goes to ESL lab website rather than doing a Google search inside the site—closes it immediately, but then gets stuck for 1.5 minutes

Finally manually enters the word “access” into ESL Lab's internal Google search bar that produces the desired results—finds a sentence that makes sense, highlights it appropriately—uses the sentence she found as a model” “Only members have access to the swimming pool in the morning” to “Only teachers have access to the meeting today and highlights it appropriately.

## Field notes from conversation with Kara

I had the opportunity to ask several students who came early to class on non-lab days what they thought of DAVI, but the only one of these students from whom I had informed consent to use her information was Kara. The notes I jotted down while talking with her consisted of phrases rather than coherent text, a sample of which is the following:

“HW on computer hard for Chinese b/c not used to doing HW on computer and don't like it—would prefer DAVI on paper—too complicated.”<sup>14</sup>

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<sup>14</sup> My intent had been to ask questions of students about their use of and feelings about DAVI on the lab days following DAVI's introduction, but learners' almost constant need for help during lab days made this impractical.

### **End-of-study questionnaires and follow-up questioning**

The 4<sup>th</sup> week of the study, on the last day, I asked students to complete a questionnaire that asked the following questions:

- 1) Do you think DAVI helped you increase your academic vocabulary? Why or why not?
- 2) What was the most interesting part of DAVI?
- 3) What was the most boring part of DAVI?
- 4) Would you prefer to use DAVI or another method to learn vocabulary the future? If you would prefer another method, what is it?
- 5) Would you recommend the DAVI system to a friend who needed to improve his or her academic vocabulary? Why or why not?

Because of low attendance the day the questionnaire was administered, the only study participants who completed it were the three focal students and two others (Rena and Elise). Before and after classes the following week, I asked them about answers they had given on the questionnaire that were unclear or unelaborated. As they talked, I wrote notes on their comments on their questionnaires, which are labeled “Questionnaire follow-up notes—[student name]” throughout the remainder of this study.

### **Summary**

DAVI was designed as an intentional application of key vocabulary acquisition research. It is important to know, however, whether DAVI is simply another “keyword method”<sup>15</sup> that, while demonstrably effective as a vocabulary learning technique, requires a kind of mental gymnastics that lacks face validity in the eyes of students (Schmitt, 1995; Krashen, 1989). Kennedy (2008) points out in relation to teaching phrases via corpora and

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<sup>15</sup> In the “keyword method,” learners think of a word in their L1 or perhaps a known word in their L2 that sounds like the unknown word they are trying to learn and create a mental image which combines the known word’s meaning with the unknown word’s meaning. For example, if I were trying to learn the Chinese word “外,” pronounced “wài,” and meaning “outside,” I might mentally picture the outside door of a house with the English word “Why?” painted on it.

concordancing software that “it is difficult to keep all but the most highly motivated learners sitting in front of a screen looking at unrelated lines of text” (p.38). DAVI is an attempt to make students’ use of corpora more interactive and self-directed, hopefully thereby averting learner boredom as much as possible. The degree to which the current version of DAVI succeeds at doing that is the topic of the next chapter.



## CHAPTER 4. RESULTS AND DISCUSSION

### Review of the Research Questions

This study addresses three research questions, namely:

- 1) Did the intermediate IEP learners in this study think DAVI is an effective means of acquiring academic vocabulary?
- 2) How are the ways in which learners completed one or more of the tasks in DAVI likely to have affected their academic vocabulary acquisition?
- 3) Are there other vocabulary learning methods learners preferred?

The first is rooted in the fact that while DAVI is designed to enable students to acquire academic vocabulary *independently*, students will not use it on their own if they do not believe DAVI helps them acquire the academic vocabulary they need. It could be argued that one way of building students' confidence in DAVI's power to help them increase their academic vocabulary is by administering a posttest whose score they can compare to that of their pretest; however, this reasoning is faulty. DAVI was not for this study, nor probably ever would be, the sole means of vocabulary study used by students. A posttest providing evidence that students *have* gained AWL vocabulary would not convince them that DAVI was the cause unless their subjective experience of using DAVI supported that conclusion. Thus, what was important for this study was whether students *believed* DAVI helped their academic vocabulary acquisition.

The second question looks at how the way in which learners completed each task in DAVI was likely to have affected their vocabulary acquisition. The third research question was designed to identify characteristics valued by students in vocabulary learning methods and materials so that, as the research indicated appropriate, the methods that genuinely benefit students could be integrated into DAVI. In addition, this research question allows me and other vocabulary materials designers to "market" materials in a way that focuses on design features that meet needs students know they have, e.g. to understand more academic words when they read them. From the platform of face validity an initial focus on learners'

recognized needs provides in the eyes of students, they can then be made aware of additional vocabulary needs they have that DAVI or another system is designed to meet, e.g. to produce academic words using standard phrasing, such as in “He gave me assistance for searching the informations of these books.” vs. “He gave me assistance in searching. . .” (Andrew, Day 10).

Answers to these questions can provide guidance on whether and how DAVI should be further developed. We will turn, then, to examine the data that answer these questions.

### **Did the intermediate IEP learners in this study think DAVI is an effective means of acquiring academic vocabulary?**

A question asking whether students thought DAVI was an effective means of acquiring academic vocabulary must find its answer primarily from data gathered at the end of the study since it concerns whether students believed DAVI could benefit their vocabulary acquisition on the basis of their introduction to and use of DAVI throughout the study. Thus, the key data used to answer this research question consist of field notes taken while informally questioning an early-arriving student (Kara) before class toward the end of the study, participants’ responses to the end-of-study questionnaire, and field notes taken on students’ answers to follow-up questions I asked regarding their questionnaire responses. Additional data that support that gathered from these key sources are derived from my introduction day field notes, screen-capture notes from focal student Andrew, and students’ DAVI uploads.

#### **Participants whose data contributed to answering this question**

Before looking at the data directly pertinent to this question, it will be helpful to quickly examine information in Table 4.1 on the students from whom these data are derived.

As mentioned in the previous chapter, only Andrew, Phil, and Tina, who uploaded 10 DAVI assignments each, were ready to shift from intentional study of GSL words to intentional study of AWL vocabulary, lacking knowledge of only approximately 33, 67, and

Table 4.1 Participants whose data are used in this usability study

	Andrew	Phil	Tina	Rena	Elise	Kara
<b># of uploaded DAVI assignments</b>	10	10	10	9	5	2
<b>Vocabulary Levels Test (VLT) scores</b>						
2k level (out of 30)	29	28	26	21	23	23
AWL level (out of 30)	19	17	8	11	19	13
<b>Implications of VLT scores</b>						
approximate # of unknown words on 1001-2000 list	33	67	133	300	233	233
approximate # of unknown word families on AWL	209	247	418	361	209	323
<b>Completed End-of-Study Questionnaire (Yes/No)</b>	Y	Y	Y	Y	Y	N

133 words respectively from the second half of the GSL. That is, these three students were the only ones who fit the profile of the L2 English learner DAVI was designed to help, and thus their data will be considered first for this question, upon which foundation relevant data collected from the other students can be evaluated. We will look first at the data collected via the end-of study questionnaire which, as can be seen in Table 4.1, was completed by only 5 participants.

### Key data relevant to research question #1

To the question “Do you think DAVI helped you increase your academic vocabulary? Why or why not?,” these 5 participants answered as follows:

- **Tina:** “Of course. Because I can learn new words every day.”
- **Andrew:** “A little bit.”
- **Phil:** “I don’t think so, coz [most] words have been learned before.”
- **Rena:** “Not very helpful for me. I complete it only [because I] think that [it] is a homework. I am not see it again.”
- **Elise:** “Maybe it useful. However, I don’t think that a good way to increase academic vocabulary because I cannot remember any words I copied from website.”

While another study participant, Kara, was absent the day the questionnaire was administered, field notes I took as I informally questioned her regarding DAVI provide insight into her perspective on whether or not DAVI was an effective means of acquiring academic vocabulary. Jotted down quickly, my notes are not a verbatim account of what she said, but I did strive accurately to record the key ideas she communicated. The notes relevant to research question #1, “Did the intermediate IEP learners in this study think DAVI is an effective means of acquiring academic vocabulary?,” indicated that while Kara thought DAVI was useful, she didn’t like that it used the Internet. She reiterated this point later, and said additionally that DAVI wasted my time, because I had to give individual feedback to each student. She also reminded me that some students would be taking TOEFL (Test of English as a Foreign Language) within the next few weeks, and said she thought they felt they didn’t have enough time to use DAVI. She said that though she and her classmates knew that this and other assignments really would help their English, they didn’t want to work on something that wouldn’t help on the test when it was coming up so soon.

### **Evaluation of participants’ data relevant to research question #1**

*Tina.* As is evident above, only Tina responded positively to the query, “Do you think DAVI helped you increase your academic vocabulary?” From the beginning, Tina was the student poised most to benefit from DAVI. Her VLT score for the first 2000 words of English was 26, meaning she lacked knowledge of only about 130 GSL words, not an exorbitant amount to pick up incidentally (Nation, n.d.). This means that Tina was ready to shift her focus from intentional study of GSL vocabulary to intentional study of AWL vocabulary. In addition, of all the students participating in the study (cf. Table 3.1), Tina had the lowest AWL score on the VLT—only 8 of 30. This means that she knew only about 150 of the 570 AWL words at the beginning of the semester, leaving 420 yet to be learned. When I asked Tina follow-up questions about her questionnaire responses, she told me that DAVI was very interesting for her. She said that the only other method she had previously used to study vocabulary was using a dictionary—and that she found DAVI more interesting.

*Andrew and Phil.* Andrew, who responded that DAVI had helped him increase his academic vocabulary “a little bit” told me during my follow-up questioning that he knew

most of the vocabulary he had encountered in DAVI already, though not all (Questionnaire follow-up notes—Andrew). Phil, as his questionnaire response above echoes, told me the same thing (Questionnaire follow-up notes—Phil). This makes sense in light of both students' beginning-of-the-semester Vocabulary Levels Test (VLT) scores that had indicated they lacked knowledge of only about 209 and 247 of the 570 AWL word families respectively. While order of frequency is not a foolproof predictor of order of acquisition, if relative frequency of AWL words in the Academic Corpus correlates even roughly with their relative frequency in these students' experience, the words from the first, second, fourth, and seventh frequency-based AWL sublists that this version of DAVI covered would likely have been among the AWL words they already had had the most opportunity to learn. It is true Andrew and Phil almost certainly still could have acquired new knowledge of syntagmatic and paradigmatic associates for these words (Webb, 2007a), but it appears they either did not realize this or did not value it.

*Rena.* Rena's opinion that DAVI was "not very helpful" is also reasonable, though for far different reasons. Among students participating in the study, the average beginning-of-the-semester score on the section of the VLT covering the first 2000 words of English was 25.2. Rena's score, however, was only 21 (Table 4.1), indicating she had meaning recognition ability for only about 1700 words of the GSL. It was thus far too early for her to begin AWL study (Nation, n.d.), though that is what her class placement demanded. It is no surprise then that Rena derived little benefit from using DAVI.

Elise also did not think DAVI was a good way to increase her academic vocabulary "because I cannot remember any words I copied from website" (Questionnaire—Elise) An examination of her DAVI uploads reveal two possible reasons for this: 1) She appears never to have reviewed the words and 2) the involvement load of her interactions with target words was minimal (Laufer & Hulstijn, 2001).<sup>16</sup> The likelihood that she did not review DAVI words can be seen in that she never copied or moved vocabulary study pages after completing them to a review day, the implication being that she did not review them. The minimal involvement load of her interactions with target words can be seen in that she did

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<sup>16</sup> Recall from the review of the research that spaced repetition and high involvement load interactions with target vocabulary are key promoters of vocabulary acquisition.

not textually enhance phrases in her “find your own example” sentences (which would have increased her involvement load by a “moderate” evaluation factor) nor did she write her own sentences using the phrases (which would have increased her involvement load by a “strong” evaluation factor). For Elise, DAVI was just about copying and pasting sentences—not only did she copy and paste example sentences for the “find your own example” segment of DAVI (actually more than required), but she also copied and pasted quotations from a general Google search when completing the “Write your own sentence” segment. Below are representative excerpts of “her own” sentences for the target word “contrast”:

- Definition of **contrast** from the Merriam-Webster Online Dictionary with audio
- **Contrast** Magazine is a lifestyle publication based in Hawaii that is dedicated to exposing the unique mixture of modern culture thriving in our islands

Note that the only textual enhancement in these “sentences” is that derived from copying the Google results for the search term “contrast.” The way in which Elise completed her DAVI assignments is probably a more eloquent indicator of how unconvinced she was of DAVI’s value than her equivocal “Maybe it useful” questionnaire response!

As mentioned earlier, I gathered additional data relevant to this research question via an informal conversation with Kara, a student who uploaded only two DAVI assignments during the course of the study (both on lab days, not on days when DAVI had been assigned as homework), when she came to class early one day. Kara told me that she and her classmates *did* know that DAVI and the other assignments I gave really would help their English (Field notes—Kara), but she reminded me that some of the students were taking TOEFL in about a week,<sup>17</sup> so they didn’t want to work on anything that wouldn’t help them on the test.

As alluded to by Kara, students’ motivation to complete DAVI assignments *was* limited. More concrete evidence of this can be seen if we consider the number of DAVI uploads participants submitted out of a possible 14—10 (3 students), 9, (1 student), 5 (1 student), 4 (1 student), 3 (1 student), 2 (2 students), and 0 (1 student) uploads (cf. Table 3.1). The data above make it clear that one reason for this was that students did not think DAVI

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<sup>17</sup> Elise was one of these students according to my Oct. 22 field notes.

was an effective means of acquiring academic vocabulary, at least not the academic vocabulary they needed for their soon-coming TOEFL exam. Further evidence of students' lack of motivation can be seen in my screen capture notes regarding Andrew's interaction with DAVI on lab day the third week of the study.

“9:02 a.m. goes to Google account—has some dead time, probably while I'm talking—does his own stuff—begins working at 9:14 a.m.<sup>18</sup>--only gets as far as “courses,”<sup>19</sup> waits almost exactly one minute, then goes back to Gmail. @ 9:17 actually types real course website address and logs in. . . .” (screen-capture notes—Andrew)

Clearly Andrew was not highly motivated to use DAVI and this was true for many of the students whom I repeatedly asked to get off YouTube or Chinese chat sites (cf. field notes—Oct. 20). It is possible that one reason students failed to view DAVI as beneficial to their academic vocabulary acquisition may have been that they failed to complete one or more of the tasks in DAVI appropriately, a possibility examined in the discussion of the second research question.

### **How are the ways in which learners completed one or more of the tasks in DAVI likely to have affected their academic vocabulary acquisition?**

Several types of data contributed to answering this question, including my introduction-days field notes; participants' DAVI uploads, particularly those from the three focal students; my notes on Andrew's and Tina's screen captures and the screen captures themselves; participants' questionnaire responses; and my questionnaire follow-up question notes. We will answer this question by considering each of the tasks required in DAVI separately.

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<sup>18</sup> Class started at 9 a.m.

<sup>19</sup> A link in the course management system housing our online course materials.

### Read the examples provided for each word

In the case of this first task, students' interaction with the task cannot be effectively assessed, for the design of this study provided no means of clearly establishing whether or not students read the examples when completing their DAVI assignments. The directions for the task are below:

*Read the sentences/phrases under "Examples" on today's first vocabulary sheet. Can you easily understand the examples? (If you don't know a word in them, *first* try to guess its meaning from the context. If you can't guess it, *then* check your dictionary.)*

While no definitive assessment of students' interaction with this task is possible, my screen capture notes provide some tentative information on how focal students Andrew and Tina used my provided examples. This is what I wrote for Andrew:

It doesn't appear he skimmed all the [results for the target words' site-specific Google search] b/c scrolled too quickly for that, but did appear to have scanned several looking for one that made sense. **I don't think he read my examples at all, based on amount of time he spent on that part of the screen.** (Screen-capture notes—Andrew)

When Andrew needed to write his own sentence for the AWL word “goal,” however, he did return to the examples (Screen capture—Andrew—minute 47:24ff). Tina did the same thing, as recorded in my screen capture notes:

She also does a super job with “despite”—**in order to figure out how to write the sentence she looked back at both her own sentence and my examples<sup>20</sup>** and appears to have worked from “despite those difficulties” to write “despite these troubles” that she then changed to “despite so many troubles.” (Screen-capture notes—Tina)

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<sup>20</sup> Determined by how she scrolled from the “Find your own examples” task up to examples provided in DAVI for the word, paused for 2 seconds (37:08), and scrolled down to the “Write your own sentence” task, wrote the word “Despite” and then scrolled back up to my example for another two seconds (37:20).



Thus, while it is uncertain that students read the example sentences at the beginning of their vocabulary study page work, if Andrew and Tina's screen capture behavior is representative of other students' interactions with the provided examples in DAVI, it does appear that learners may have used the provided examples as support for composition of their own sentences when completing Step 4.

For the other tasks in DAVI, multiple sources of data contribute to answering research question #2, "How are the ways in which learners completed one or more of the tasks in DAVI likely to have affected their academic vocabulary acquisition?" and make patterns across and within participants more clear.

### **"Find your own examples"**

Step 2 of the DAVI directions asks students to:

"Use a 'Find your own examples' search option to *do a Google or corpus search. Find 1-3 easy-to-understand examples*. Paste these examples onto the vocabulary sheet."

*Overview of the step 2 findings.* The "Find your own examples" task was difficult for students to learn at first and those who did ultimately master the technical aspects of performing it often chose to copy less-than-comprehensible contexts and often from sources other than those listed in DAVI. Even when they did use the sources provided in DAVI, there sometimes were not contexts available whose ratio of known words was low enough that students could be expected to learn the target word incidentally from rereading the contexts on review days<sup>21</sup> and students sometimes chose contexts that consisted of learner comments whose English was far from standard.

*Beginning-of-study challenges with this task.* My notes from the first and second DAVI introduction days (Field notes—Oct. 20 & 22) reveal that this step was initially much more difficult for students than I had expected it to be. Many of them seemed completely

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<sup>21</sup> I had not realized until reproducing student searches during the data collection period of this study how examples available for target words were often far from being "easy-to-understand."

unaware that keyboard shortcuts exist for common computer commands (e.g. Ctrl+X for “Cut”; Ctrl+V for “Paste”) and perhaps even of the existence of the commands themselves (Field notes, Oct. 22). In addition, when writing directions for DAVI, I had written out useful keyboard shortcuts only for PCs, assuming students would know how to “translate” them for Apple computers if needed. My assumption was unfounded, however, and unfortunately students’ first contact with DAVI took place in an Apple computer lab where their attempts to use the shortcuts I had provided failed (Field notes, Oct. 20 & 22).

Students’ understanding of my explanation for how to do step 2 was further complicated by the fact that none appeared familiar with Google’s capacity for doing site-specific searches, much less with how to exploit that capacity (Field notes, Oct. 20). This may have been due to their unfamiliarity with Google as a search engine, since it has only a 32.7% penetration rate among search engines in China and is first choice for only 12.7% of users there (Fu, 2009). My cursory experimentation with the most popular search engine in China, BaiDu, revealed that if it can indeed do site-specific searches, they are not via the search terms used in Google, e.g. “theory site:www.rong-chang.com/eslread/.”

Students’ struggle in understanding my written and oral directions for step 2 may not only have been because they did not know the concepts of cutting or pasting or performing an Internet search, but also because they did not know the English computer terminology that expressed these concepts (Field notes, Oct. 22). How much of students’ initial difficulty with this step was due to their lack of familiarity with the computer concepts and how much was due to their lack of familiarity with the English labels for these concepts is uncertain, however, as I never formally assessed their knowledge of either.<sup>22</sup>

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<sup>22</sup> Regardless of whether students’ primary source of struggle related to lack of familiarity with computer concepts or English computer terminology, the results were that the introduction days were frustrating for me and probably also for them as they were unable to perform even basic tasks independently, such as that of renaming the DAVI file they downloaded from our course website with their own names (required because I wanted to avoid having multiple files named DAVI.xls to keep organized while grading). They were confused because they didn’t know to go to “File>Save As,” but instead went just to “Save” (Field notes, Oct. 22). They were similarly confused about how to move between the different weekly tabs inside DAVI, apparently either because they weren’t used to navigating documents or the Internet with tabs, because Excel places tabs differently than the Web browsers they usually use, or because they didn’t know the English term for “tab” (Field notes, Oct. 22).

*Students' end-of-study performance of this task.* Students' uploads indicate that most students did ultimately master the site-specific Google search aspect of step 2 in DAVI. There were a few exceptions to this, however, including Tina, one of the best students in my class. Her screen capture the third week revealed that when she searched for example sentences, she went directly to the ESL-Lab website and used the in-site search bar there (Screen-capture notes—Tina). This was effective as long as the ESL-Lab site actually had examples for the target word she was working on, but when it didn't, her DAVI uploads make it appear she performed just a general Google search. In light of her generally conscientious study habits, this probably means she never did understand how to do site-specific searches in DAVI.

*Problems in the use of learner-oriented websites.* The use of websites targeted at L2 English learners to facilitate students' academic vocabulary acquisition was problematic, for the largest of these sites contain not only professionally written texts targeted to learners' level of vocabulary ability, but also posted responses to the texts from readers whose English proficiency varies widely. Unfortunately, neither the search results in Google nor the search results from in-site search functions consistently or clearly identify whether a given result is written by a professional author or a learner. This resulted in study participants sometimes copying and pasting problematic "Find your own example" sentences from responses posted by a site's readers such as the following:

- "If you do not know, all the medicine cancer are tested in cancer patient voluntary." (Andrew, Day 16, pasted from *Voice of America* [VOA] news, special English)
- "5 Jun 2009 ... by making them take fresh heart at subsequent steps, saying them it's water over dam,I mean forgetting about it and thinking of the. . ." (Phil, Day 15, from *VOA* news, special English)<sup>23</sup>

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<sup>23</sup> While I had accompanied my listing of BBC's Learning English site on DAVI's "Find your own example" search options with the directions: "Avoid examples that sound like a student wrote them," I had not realized I needed to do the same for VOA search options. I never identified in students' uploads an errant example taken from BBC, but this may mean only that students did not use this search option, as it was almost at the bottom of my list of options, not that they successfully differentiated between the professional and learner examples.

*Comprehensibility problems in students' choice of contexts.* Students often chose highly sophisticated sentences, leading me to question whether they really had found them easily comprehensible, as the step 2 directions indicated all “Find your own examples” sentences were to be. Note the difficult vocabulary marked in bold in the following example sentences for the target words “concentration” and “subsequent”:

- “28 Sep 2009 ... NORA VOLKOW: "There was a lower concentration of **dopamine** markers in the brain of individuals with **A.D.H.D.**, specifically in the areas of. . . .” (Andrew, Day 14, pasted from VOA news, special English)
- “Growth was **dampened** by a **softening** of the global economy in 2001, but **picked up** in the subsequent years due to strong growth in China.” (Tina, Day 15, from an indeterminate source<sup>24</sup>)

For certain words, this may have been inevitable, as I discovered during data analysis that even the learner-oriented sites I had listed for students to use to find their own example did not always offer easily comprehensible examples. Yet even when easily comprehensible sentences were available, students sometimes chose examples that seem beyond their level of comprehension. Exactly why they chose the sentences they did is unclear, for both my screen capture notes (Screen capture notes—Tina; screen capture notes—Andrew) and my own reproduction of students' searches, that I did specifically to find the answer to this question, indicate that students did not usually select the first of any given set of search results. A comment made by Elise (Questionnaire follow-up notes--Elise) provides one explanation. She told me she did not always read the search results. She just pasted ones that had a period because they were a whole sentence. Some of those she pasted she understood, but others she pasted only because they were complete sentences.

*The use of sources other than those provided in DAVI.* Tina's example sentence above pasted from “an indeterminate source” points to another pervasive indicator that the “Find your own examples” task in DAVI did not work as intended. It also points to the first of two problems I identified with these non-“Find-your-own-examples” sources: their difficult vocabulary. While Tina's sentence above was not from an online English/Chinese

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<sup>24</sup> This sentence exactly matches 123 Google search results, none of which are from the “Find your own example” search options I provided for this word

dictionary, as I searched “suspicious” example sentences from different students’ uploads, I repeatedly found ones that were. In the case of very low-level students like Rena who almost certainly did not have enough vocabulary to have found comprehensible example sources from the “Find-your-own-examples” sources I’d provided, this is understandable, since the online Chinese-English dictionary examples had Chinese translations. Unfortunately, while the Chinese translations may have scaffolded her understanding of the examples temporarily, because the example sentences often used very difficult vocabulary, they almost certainly would have been even less comprehensible to her on review days than the examples she would have found using the sources listed in DAVI:<sup>25</sup>

- “He refused the proffered **assistance**.” (Rena, Day 10)
- “Water is channelled through a **series** of irrigation canals.” (Rena, Day 13)

An additional reason I discouraged students’ use of online Chinese/English dictionaries was that the English sentences they offered were not always standard, for example:

- “On the course she received a thorough training in every aspect of the job.” (Rena, Day 7)

*Students’ comments on the “Find your own examples” task.* When Andrew and Phil answered the “Should we continue using DAVI?” questionnaire question, “What was the most boring part of DAVI?” they both identified this task. Phil told me he didn’t really think while he was copying and pasting—though he also told me he did understand the sentences that came up (Questionnaire follow-up notes—Phil). Andrew said that the sentences were very easy to understand, but that he couldn’t “write sentence like that professional” (Questionnaire follow-up notes—Andrew). Tina, on the other hand, held a very different opinion, suggesting that finding her own examples was the most interesting part of DAVI. In answer to the question “What is the most interesting part of DAVI?” Tina wrote: “Find out the sentences with new words in the website and know about the real meaning about them”

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<sup>25</sup> Of course, Rena’s “I complete it only [because I] think that [it] is a homework. I am not see it again” statement (Questionnaire—Rena) implies she did *not* review the sentences, so in her case, this was not an issue.

(Questionnaire—Tina) She responded to my follow-up questioning by explaining that many sentences came up when doing the website searches and the many sentences help to understand the real meaning of the word (Questionnaire follow-up notes—Tina).

### Applying textual enhancements

Step 3 asks students to:

*“Compare your example(s) to the sentences/phrases under “Examples [that I provided].” Mark any fixed phrases or fixed parts of variable phrases from your examples in **bold**. Mark any variable parts of variable phrases from your examples in **bold italics**.”*

Some students never mastered this step, even those who were relatively faithful in uploading their DAVI homework. For example, Phil, who had the second highest Vocabulary Levels Test (VLT) scores at the beginning of the semester, textually enhanced with bold italics only. Of the students who uploaded fewer than 10 DAVI assignments, some never textually enhanced phrases at all and others, like Phil, enhanced phrases, but not according to the DAVI directions. While Phil did not master this step, the other two focal students, Andrew and Tina, did. Tina attributed her outstanding ability to textually enhance her DAVI assignments to her grammar being “a little good,” as that enabled her to easily understand what I meant when talking about students’ marking phrases (Questionnaire follow-up—Tina).

### “Write your own sentence”

Step 4 of the DAVI directions asks students to:

*“Write your own sentence using the word. Try to use the word in one of the fixed or variable phrases you marked in **bold** or **bold italics**. That will help you remember the phrase.”*

Tina’s exceptional phrase-marking ability as described earlier appears also to have enabled her to frequently use phrases from the examples in the “Write your own sentence” task. Andrew, although he wrote on the “Should we continue using DAVI?” questionnaire

that he found using the target words to write his own sentence the most interesting part of DAVI, used phrases in his own sentences less frequently than Tina did. He explained to me (Questionnaire follow-up—Andrew) that it sometimes was hard for him to imagine a context for the phrases in the examples, which meant he could only create sentences using the target word itself. A focus on phrases did help him avoid unidiomaticity at times, however, for the screen capture (Andrew, minute 47:24ff) I have for him indicates that while he first wrote the unidiomatic sentence, “I set up a goal for my study,” he altered it after scrolling up to review the example sentences I had provided in DAVI for the word, one of which was “I always set goals that are so high.” Immediately after reading the provided examples,<sup>26</sup> Andrew deleted “up” from his sentence and correctly textually enhanced the phrase “set a goal.” Andrew found this part of DAVI more interesting than the “Find your own examples” step because whereas the “Find your own examples” step “basically relies on [a person’s] technology ability,” writing 3-5 sentences helps one remember [the target word] (Questionnaire follow-up—Andrew). Andrew further explained that writing one’s own sentence was useful because in this step he needed to think about how to make a sentence, using his own skill.

Phil also identified “writing own sentence” as the most interesting part of DAVI (Questionnaire—Phil). He told me that *using* helps one remember more and he like the step because it enabled him to communicate with foreigners or others (Questionnaire follow-up—Phil). On further questioning, he explained that he could maybe use the target word in his future communication. The possibility of using a word learned in future communication was clearly important to Phil because when he filled out the questionnaire a few days prior to my follow-up questioning, he said that his preferred method of learning vocabulary was to “communicate with others by new words” (Questionnaire—Phil).

I identified two cross-participant patterns in how students completed this step in DAVI during my examination of student uploads. First, participants rarely followed the step 3 directions asking them to use phrases from the examples when writing their own sentences, but opted instead to use just the target word itself. Second, students sometimes cut and pasted sentences taken from the Internet for this step rather than writing their own,<sup>27</sup> even

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<sup>26</sup> Determined by his scrolling and mouse movements.

<sup>27</sup> Determined by my searching quotes from students’ “own” sentences in Google.

outstanding students like Tina. Her “own” sentence for the AWL word “voluntary” is “She's very taken up with voluntary work,” a sentence easily traceable back to several online Chinese-English dictionaries<sup>28</sup> (Tina, Day 16). I could not find a source for some student sentences that I questioned were really their own composition, but based on the number of sentences I did find copied from online sources, I'm inclined to imagine these also were not written by my students, but rather came from the ubiquitous electronic Chinese-English dictionaries that I often see them using.

Unfortunately, I did not realize the extent to which students were copying “their own” sentences until the close of my data analysis, so I did not have the opportunity to ask why they were doing it. I suspect the following two reasons: 1) Students, particularly when in a hurry and particularly those who did not view DAVI as helping them to acquire the vocabulary they needed, copied examples from the Internet (or their dictionaries) because it was easy; and 2) Students only felt confident enough to write their own sentences for words they already knew or for “easy” words. They were unwilling to rely on the example sentences as a guide for creating their own. Evidence for this second reason can be seen in how Phil appears to have written his own sentence for “subsequent” (“I can't remember subsequent events.”) and “predict” (“If I can predict future, I hope to meet my future wife.”) but not for “impose,” which appears to have been copied from a general Google search: “You can't impose the responsibility on me” (Phil, Day 15).

### **Using the “review day schedule”**

Step 5 of the DAVI directions asks students to:

*“Cut and paste the vocabulary sheet under the next review day's vocabulary sheets. Don't forget to delete that review day from the "Review" list!*

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<sup>28</sup> Many of these apparently different online dictionaries share exactly the same example sentences for particular words in spite of their differences in domain names.



None of the 10 participants in the study mastered the review day scheduling. Student uploads make it clear that even high level students like Phil and Tina, who (at least some of the time) *did* move target words to the next review day as directed, never found new examples for target words or wrote their own new sentences for them on the review days as the DAVI directions required. Clearly I did not successfully communicate to students the purpose of the review days nor how review days were supposed to work. In fact, even students (e.g. Philip, Andrew) who *did* try to paste studied words to their review day sometimes had trouble because they accidentally pasted a vocabulary study page to the wrong column in Excel, meaning that the spacing for columns both in the moved vocabulary study pages and often in the vocabulary study pages above the moved pages was distorted. Also, on the screen capture day the third week of the study, Tina accidentally moved vocabulary study pages +6 days instead of + 4 days when trying to follow the review day schedule (Screen capture notes—Tina). The review day step appears to have been far too complex for all of the students, including the high-level focal students. This is in spite of the fact that on the 4<sup>th</sup> introduction day, I worked one-on-one or in small groups with nearly all of the students showing how to move vocabulary study pages and delete the review day reminder at the bottom of each page on the fourth DAVI introduction day (Field notes, Oct. 27).

## Summary

The research question asked at the beginning of this section was “How are the ways in which learners completed one or more of the tasks in DAVI likely to have affected their academic vocabulary acquisition?” The data discussed in this section make it clear that for basically every task that students were to complete in DAVI, the way in which they completed it is likely to have negatively affected their vocabulary acquisition. This is perhaps most apparent for step 6, “Using the review day schedule,” as even the best students who did move vocabulary study pages from the day they originally began to study target words to the appropriate review day did not review them on the days scheduled. Certainly, also, students’ vocabulary acquisition was hindered when they cut and pasted sentences that were not easily comprehensible for step 2, “Find your own examples” and when they chose

to cut and paste sentences rather than writing their own for step 4, the “Write your own sentence” task. It is understandable then that the answer to research question #1 indicated that overall, students did not feel DAVI benefited their academic vocabulary acquisition and evident that for DAVI or DAVI-like systems to benefit students in the future, significant changes must be made. One consideration in determining changes to be made is students’ beliefs about what vocabulary learning methods are effective and desirable and it is this consideration that is addressed in research question #3, “How do students prefer to study vocabulary?”

### **How do students prefer to study vocabulary?**

Answers to this research question were obtained by means of end-of-study questionnaires completed by participants and field notes taken when I informally questioned Kara when she arrived early to class one day,

#### **Using a faster method**

Many of the students complained about how DAVI was a very slow learning method. Andrew wrote on his end-of-study questionnaire:

- “Everyone prefer a fast way to remember the words. Comparing with other simple methods, DAVI is a really slow method” (Questionnaire—Andrew).

Elise echoed that point on her questionnaire where it asked whether she would recommend DAVI to a friend needing to improve his or her academic vocabulary:

- “Most of them have seldom time to finish DAVI” (Questionnaire—Elise).

The notes I took during my conversation with Kara the day she came to class about 10 minutes early clarify this point further. She told me that students think DAVI takes time. The method they use is a vocabulary book [probably notebook] containing English and

Chinese word pairs. With this method, she reported that they can remember 10 words a minute. In addition, she reminded me that some of the students were taking TOEFL in about a week, so some students did not want to work on something that would not help them on the test when it was coming up soon (Field notes—Kara).

### **Using a non-computer-based method**

Kara, though she submitted only two DAVI uploads, both during the first week when students were using DAVI in the lab, made an additional comment that may further explain some of students' negative response to DAVI. She told me that homework on the computer was difficult for Chinese because no middle school or high school teacher had ever given them computer-based homework before because not everyone in China has a computer at home. Computer-based homework was new to them and they did not like it. She said she would prefer a paper-based DAVI (Field notes—Kara). While none of the other students ever mentioned disliking the fact that DAVI was computer-based, Kara provided evidence that she was not alone in disliking this kind of homework by saying that in their IEOP listening/speaking class, some of the students did not do the computer homework unless the teacher threatened them by saying they would only be allowed to take the test if their homework had been completed. She again tempered her complaint by saying DAVI *was* useful; the problem was she did not *like* doing homework on the computer (Field notes—Kara).

## **Summary**

The results of this study make it evident that DAVI must be modified if it is to be accepted by students and to provide significant benefit to their academic vocabulary acquisition. For the most part, participants in this study did not think DAVI is an effective means of acquiring academic vocabulary. None of the DAVI tasks for which this study provided appreciable means of assessment were consistently completed by students in the way they had been designed and, more importantly, in ways that were likely to contribute to their academic vocabulary acquisition. Factors to be considered in weighing possible

changes to be made to DAVI include the fact that the participants in this study definitely preferred a faster method of learning vocabulary and possibly also one that is not computer-based. Other implications and recommendations suggested by this study are discussed in chapter 5.

## **CHAPTER 5. CONCLUSION**

The aim of this study was to test the usability of my technology-based academic vocabulary learning system (DAVI), a system designed to enable English-as-a-second (or foreign)-language students to develop their academic English vocabulary independently (outside the classroom and without easy access to a teacher). As in every study, this usability study had limitations and these are discussed below. Following that is a discussion of several implications of the study and recommendations connected to them.

### **Limitations**

#### **Introduction to the study**

One limitation of this study was that I read through the long informed consent document with the students the first day of the study, a process students apparently found boring, for I discovered more than one student surfing the Web rather than reading the document along with me. It appeared that both this and the slow Moodle<sup>29</sup> account set-up process were a negative experience affectively for students, and this may have created in students the expectation that DAVI would be a boring and frustrating process.

#### **Student attendance**

The most significant limitation of this study was students' sporadic attendance throughout the study, but especially during the week of introduction to DAVI. This created several other limitations, namely that on the introduction days, I spent so much time helping students who had missed previous days "catch up," I had little time to introduce aspects of DAVI I had not previously covered to the class as a whole. In fact, it was not until the fourth day of introduction that I was able to introduce all the six steps of using DAVI and ensure that the students had at least a rudimentary understanding of them by their basically successfully practicing the steps independently.

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<sup>29</sup> Moodle is a course management system used in Iowa State University's English department.

## **Implications and Recommendations Connected to Learner Motivation**

DAVI's failure to motivate students is probably its primary failure. This study revealed several reasons for this failure that must be addressed if future versions of DAVI or other DAVI-like curricula are to succeed with learners such as those in this study.

### **Explicitly connect vocabulary materials to TOEFL**

First of all, the findings of this study make it clear that teachers and materials designers attempting to serve TOEFL-oriented students by facilitating their AWL vocabulary acquisition must not assume learners will automatically recognize the benefit of learning AWL vocabulary. This is evident in that while students in this study believed DAVI would benefit their English generally, they were much less convinced that it and the vocabulary it covered would benefit them on TOEFL. Teachers and materials designers need to maximize every opportunity to point out how AWL vocabulary acquisition and the materials used to teach it *will* benefit students' TOEFL scores. This can perhaps be accomplished by providing students with TOEFL study materials in which all the AWL words have been highlighted or by providing students, after they complete practice TOEFL listening exercises, with a transcript in which all AWL words have been gapped so that they must listen once more to fill in the gaps. A similar but higher involvement load task would be a gapped sample TOEFL reading text accompanied by the list of AWL words students are to use to fill the gaps.

### **Acknowledge learners' need to acquire post-AWL vocabulary**

Students know they need to study more difficult vocabulary than merely the AWL to be equipped to pass TOEFL, but like I have nowhere acknowledged this need earlier in this paper, I failed to acknowledge it to the learners themselves. This most likely gave them the impression that I was out of touch with their real vocabulary learning needs and undermined my credibility. Had I acknowledged this real need, I would likely have had a greater platform for helping them to recognize that they had an additional need, to acquire deep understanding of AWL vocabulary. In future studies with TOEFL-oriented learners, it is probably important that teachers (and perhaps materials designers) explicitly acknowledge

learners' need to learn post-AWL vocabulary. On this foundation, they can recommend a two-pronged method of vocabulary study, one aspect of which involves acquiring deep understanding of the highly frequent, highly productive AWL vocabulary and another which involves acquiring a more superficial understanding of less frequent academic vocabulary, such as a field's technical terms.

### **Acknowledge the value of learners' preferred study methods**

Something else I might have acknowledged that probably would have rendered my presentation of the value of DAVI more credible to students is that time-intensive vocabulary study methods like DAVI are not the best way to study all kinds of vocabulary. Rather, only the most important words, such as those of the AWL, deserve such time investment. For less important, less frequent words, efficient, broad learning by means of L1-L2 word pairs (Nation, 2001), or perhaps by memorization of a short example sentence (Ding, 2007), the learning methods the students in this study preferred, *are* better.

### **Use the Productive Levels Test to show students their lack of AWL knowledge**

Students at the level of the learners in this study need to be helped to realize their mastery of AWL vocabulary is inadequate to justify their turning away from that vocabulary to an almost exclusive focus on "more difficult" vocabulary. They can be helped to understand this at the commencement of their use of DAVI or a DAVI-like system by their taking the more difficult Productive Levels Test (Nation, 2001) instead of the general Vocabulary Levels Test (Schmitt et al., 2000) used in this study. They will undoubtedly do much more poorly on the Productive Levels Tests than on the VLT that tests only recognition knowledge of AWL vocabulary. This could help them see their need to work on AWL vocabulary.

### **Create a game-like system in which learner performance controls the review schedule**

Another means of encouraging learner motivation would be to design DAVI and DAVI-like systems similarly to the program described in Cobb (1998). Cobb's program was designed so students would "compete" against themselves, as the "expanded rehearsal"

schedule for each target word was controlled by how well or how poorly they performed on a wide variety of tasks. The better a learner performed the tasks, the less he or she would be required by the system to review target vocabulary. The tasks could be designed, as they were in Cobb's (1998) study, in such a way that the more comprehensible the contexts a student chose to input into the program and the greater the number of contexts chosen, the easier it would be for him or her to succeed on the tasks.

### **Use quizzes and exams to provide extrinsic motivation**

The implications and related recommendations described above all relate to building learners' intrinsic motivation to use DAVI or a DAVI-like system. However, for students like those in this study whose intent was to take the paper-based TOEFL rather than the Internet-based TOEFL, additional extrinsic motivators, like quizzes and exams measuring multiple kinds of word knowledge may also be helpful. While quizzes and exams could facilitate intrinsic motivation as well, as they would give learners' concrete evidence DAVI was helping their academic vocabulary develop, their primary purpose would probably be to reward or "punish" learners for doing or failing to do their homework. Because the paper-based TOEFL requires test-takers only to process vocabulary receptively, the efficient rote memorization methods to which students are accustomed are likely to have comparable degrees of success (particularly if they memorize example sentences and not just L1-L2 word pairs) in assisting learners' TOEFL performance as the two-pronged approach recommended above. Yet, in terms of facilitating learners' success at university study in the U.S. after they do pass TOEFL, the two-pronged approach will certainly be much more successful as it builds students' ability to use AWL vocabulary productively and not merely receptively, so students need to be encouraged in every way, both by means of intrinsic and extrinsic motivation, to use the two-pronged approach.<sup>30</sup> Allowing learners to be "in control" in this

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<sup>30</sup> An additional means by which learners could be given control over their learning, and thus their intrinsic motivation in connection to using DAVI could be facilitated, is that as long as they receive a given high score on a particular day's quiz or test, they could be allowed to choose which of the AWL words included in the DAVI homework for that day to study, if any, and which of the DAVI tasks they wished to do with those words, if any.



way could increase their motivation even if they struggle to see how learning the AWL will provide significant benefit to their TOEFL score.

## **Implications and Recommendations Connected to Materials Design**

This study indicates that for DAVI to benefit L2 English learners' academic vocabulary acquisition<sup>31</sup>, several changes to the system must be made. Nevertheless, the materials design process used in creating DAVI that began with a thorough reading of the research and continued to designing tasks specifically in light of that research is a process that all materials design should take.

### **Introduce the system by means of video tutorials**

One of the likely reasons for DAVI's failure was that the prolonged introduction period (4+ DAVI introduction days), during which I was unable to quickly respond to various learners' questions because I was too busy helping their classmates, likely convinced them that DAVI was both too complex and boring. DAVI *is* complex and to the degree its complexity cannot be eliminated by the recommendations described above, it is probably better introduced by means of a series of short video tutorials, one for each divisible aspect of using the system, that students could watch as directed and then refer to later in the course when they needed a refresher, e.g. "Creating a Moodle Account," "Marking Fixed Phrases," "Marking Variable Phrases." This would probably be much more effective than the long example-filled text document provided inside DAVI and in paper form the first day of class during this study. By limiting tutorials to between 1 and 2 minutes each and by having each pinpoint a single problem/step and utilize screen shots, students would need to watch only the sections relevant to their specific needs. This should drastically reduce questions students need answered by the teacher. It would also free the teacher from spending time helping

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<sup>31</sup> Because all participants in this study were Chinese L2 English learners, it is likely that the implications are valid only for this population. Chinese students are likely to share similar vocabulary-learning experiences and to have similar concepts of how vocabulary is best learned (Wray & Fitzpatrick, 2008; Ding, 2007), but it is uncertain whether these experiences and concepts are likely to be shared by students of other ethnic backgrounds.

previous absentees catch up so he or she could focus on helping students who really need it and on keeping students on task.<sup>32</sup>

### **Use a Web-based interface**

The Excel-based interface DAVI used was cumbersome. Future versions of DAVI and DAVI-like materials need to be simpler, particular the review day scheduling step. One possibility would be to create DAVI to work on an online flashcard platform like Anki<sup>33</sup> that allows learners both to input data to their own flashcards and to control the review day schedule. Another possible platform would be Google docs.

### **Use a Learner-Comprehensible Corpus as the “Find-your-own-examples” source**

One key implication of this study impacting the design of future versions of DAVI and other similar curricula is that web-based resources for L2 English learners with the vocabulary needs of students similar to those in the present study appear not yet to be adequate for allowing students to successfully use these resources on the World Wide Web as a giant corpus and Google as a concordancer. Two of most significant “Find your own examples” sources in this study contained both material by professional writers written for L2 English learners and comments written by the learners themselves. The Google search mechanism used as a concordancer in this study was unable to distinguish between these two different groups of writers, thus participants in this study sometimes chose example sentences from those written by other learners in nonstandard English. In addition, during the materials design process, it was difficult to identify sources of comprehensible contexts, particularly for the less frequent AWL words. Thus, until web sites are build in such a way as to make it possible for search engines to differentiate between professionally written materials and responses posted by readers and until a significantly larger body of material comprehensible to ESL learners but containing AWL vocabulary is developed, a system like

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<sup>32</sup> Both I and other IEOP teachers struggle to keep students off non-class-related websites such as Chinese chat sites, YouTube, etc., on lab days, so teachers must be free to “police” the banks of computers in the labs in order to maximize the amount of progress students make in using computer-based educational systems like DAVI.

<sup>33</sup> Available at <http://ichi2.net/anki/>.

DAVI needs to rely on a dedicated Learner-Comprehensible Corpus. This corpus should be built of texts carefully selected for both comprehensibility and their use of standard English and could be from high-quality ESL websites such as those used in DAVI or from students' textbooks (Cobb, 1998) or perhaps adapted from MICASE (Michigan Corpus of Academic Spoken English)<sup>34</sup>.

### **Provide paper-based supplements**

While DAVI's lack of apparent connection to TOEFL and its unwieldy interface undoubtedly were the key factors affecting learners' negative response to DAVI in this study, Kara's comment that Chinese students are more familiar with and therefore prefer paper-based curricula is probably worthy of note. While learners must do the Internet search step (or, for future DAVI versions, the Learner-Comprehensible Corpus search step) via computer, their desire for paper-based materials could be partially met, at least, by means of a print option provided at the end of each day's computer work. One print option could provide a printable view of all of that day's new and review words' example sentences. Another could allow students to choose the words for which they want example sentences printed. Another could create a printable fill-in-the-blank quiz providing a gapped version of either student-selected or random, computer-selected example sentences from that day's target words.

### **Summary**

A key goal of all the recommendations listed above is to provide what Horst, et al. describe as "the volume of vocabulary processing that researchers have long argued was possible. . .avoiding the need for every instance of processing or rehearsal [to] pass through a teacher" (Horst, et al., p. 106).

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<sup>34</sup> Available at <http://micase.elicorpora.info/>.

## **Recommendations for Future Research**

Three recommendations for future research can be made based on this study. First, while the research has identified both expanded rehearsal of target vocabulary and high involvement load interactions with it as conducive to acquisition, the ways in which these two means of strengthening acquisition interact has not been addressed. How do varying levels of involvement load in a learner's interaction with a target word affect the number and spacing of repetitions he or she needs to learn it? In studies like the one described in this paper in which a specific vocabulary learning system or technique is being tested, how much can the level of involvement load be reduced and the number of repetitions be decreased before long-term acquisition is negatively affected? How much should the level of involvement load increase and the number of repetitions increase to assure the desired quantity of acquisition takes place? (cf. Laufer & Hulstijn, 2001).

The second recommendation is an outgrowth of the first. If we acknowledge the value of enabling learners to take charge of their learning, we need to train learners how to appropriately manipulate the involvement load of their interactions with target vocabulary themselves, as well as the number and spacing of repetitions. For this to happen, research on effective means of training learners to manipulate these factors facilitative to vocabulary acquisition must take place.

While this usability study primarily addressed what learners *thought* about DAVI and why they might have held the opinions regarding DAVI's usefulness they did, once a DAVI-like system has been developed that students do believe benefits their vocabulary acquisition, it is important to determine whether or not the system does indeed provide the vocabulary acquisition benefit they expect of it. This could be determined by means of a quantitative study in which pre- and post- test scores of a control and experimental group are compared. The control group could be allowed to use whatever vocabulary study methods they prefer (probably the memorization of L1-L2 word pairs if the learners are like those in this study!). The experimental group could use the two-pronged approach recommended above. The relative efficacy of the two vocabulary study means could be compared and if the DAVI system does indeed prove comparable or superior, future learners could be told of the study's findings, which should further facilitate their intrinsic motivation to use the study.

## **Conclusion**

Because adequate repetition of target vocabulary is not likely to occur naturally for L2 students, either in or outside the classroom, it is important that students be equipped to deeply process target vocabulary with appropriate repetition independently. While this study revealed DAVI was not successful in accomplishing effective and efficient academic vocabulary acquisition among students, it also pointed to ways in which DAVI or a similar system might be developed to become more effective. It is hoped that the findings of this study can benefit researchers, materials developers, and teachers who are aiming to help L2 English learners get over the “lexical bar” of academic vocabulary (Corson, 1995, as cited in Coxhead, 2008, p. 158).

## APPENDIX

### Comprehensible Contexts in DAVI

#### Reasons for the use of the Corpus of Contemporary American English

All of the provided example sentences in DAVI come from Mark Davies' *Corpus of Contemporary American English* (COCA). I chose to use COCA (1990-2009) as a source of example sentences for two reasons. First, inasmuch as learners' English ability allowed, I wanted to provide them with authentic input (Doughty & Long, 2003). Also, were I to create my own example sentences, it was unlikely I would be able to match the variety of contexts a corpus like COCA could provide, as almost certainly the first context she formulated would prime my mind (semantically, syntactically, etc.) to think of the target word in connection to that context (e.g. "data analysis") and hinder me from being able to come up with realistic sentences that used the word in other contexts (e.g. "The girl's frequent analysis of her feelings sometimes made her friends uncomfortable."). This could be injurious to learners who need to meet words in a variety of contexts and situations of use in order to clarify their understanding of the words' semantic boundaries (Cobb, 1998).

#### Five comprehensibility criteria

As I evaluated COCA contexts for inclusion in DAVI, I applied five comprehensibility criteria. The criteria required that all provided examples 1) contain only GSL vocabulary, previously studied AWL words, proper nouns, and other words students would likely already know or easily be able to figure out, e.g. "roommate," 2) require only background knowledge intermediate EFL (English-as-a-Foreign-Language) learners could be expected to have, 3) not use idioms students would be unlikely to know, 4) not use meanings of polysemous GSL words students would be unlikely to know, and 5) be self-contained. The comprehensibility criteria were applied in order to enable learners to focus on the target vocabulary in all examples provided in DAVI without becoming distracted by non-target-word-related questions about meaning. One further criterion used for evaluating COCA contexts dealt with whether they could furnish examples no longer than a single line. The

single-line requirement was instituted to avoid students' negative affective response to overly-dense-looking examples and ultimately, to DAVI.

*Comprehensibility criterion #1.* While comprehensibility was the primary concern behind the first five criteria, it was not the only concern. For example, the initial requirement that all COCA contexts used in DAVI contain only GSL vocabulary, previously studied AWL words, proper nouns, and perhaps one or two additional words that I believed students could be expected to know or easily be able to figure out had the additional goal of enabling learners to acquire the target vocabulary when skimming the provided examples on the various words' review days. Such incidental acquisition, however, could only occur if the sole unknown vocabulary in examples was the target word being learned, for otherwise the unknown word ratio would fall significantly under the 95-98% Liu and Nation (1985) found necessary for incidental vocabulary acquisition. (It is true that the provided examples were so short that even one unknown word—the target word—generally put the known word ratio under 95%. However, it was assumed that by directive contexts from COCA having no additional unknown words besides the target word would enable learners to accurately guess the target word's meaning in spite of the less-than-95% known word ratio. The evaluation of COCA contexts in light of this first comprehensibility requirement made it rapidly apparent, as Figure 9 demonstrates, that my original goal to use primarily authentic (Doughty and Long, 2003), directive contexts (Beck et al., 1983) for the provided examples was unrealistic. Not even the fact that I primarily searched for example sentences within COCA's spoken section, because conversation generally has a greater ratio of GSL words to non-GSL words than other genres (Nation, 2001), helped.

*Comprehensibility criterion #2.* Actually, the use of the spoken section of COCA introduced additional difficulties. These related to the second comprehensibility criterion--that provided examples require only the background knowledge intermediate EFL (English-as-a-Foreign-Language) learners could be expected to have. COCA's 400+ million word size and design as a genre-balanced corpus necessitated that its 80 million word spoken section consist of transcripts already in existence, i.e. those from TV and radio programs (Davies, 2008-). (The immensity of a 400+ million word corpus—and an 80 million word

29	2009	SPOK	Fox_Hannity	out earlier today, 22 million Americans according to the <b>Congressional Budget</b> Office' s ANALYSIS of Obama' s health care system, 22 million Americans will lose their current
30	2009	SPOK	Fox_Baier	going to cost more. I think that they didn' t do a complete ANALYSIS of the whole bill. <b>BAIER</b> : Could be \$2 <b>trillion</b> ? <b>KONDRACK</b> :
31	2009	SPOK	CNN_Velez	<b>VELEZ-MITCHELL</b> : And this plane had to land. So -- so give us your ANALYSIS of the bird <b>issue</b> . <b>WOLK</b> : Well, clearly, you had a double
32	2009	SPOK	CNN_Velez	voice <b>recorder</b> . Theyll <b>synch</b> those up. Theyll pull the engines off and do ANALYSIS. Theyll be able to tell exactly how many birds, if it was birds
33	2009	SPOK	CNN_Velez	this information been <b>conveyed</b> early on. <b>VELEZ-MITCHELL</b> : You are right; much more ANALYSIS of the Caylee Anthony coming up in just a moment. Stay right there.
34	2009	SPOK	CNN_Velez	<b>VELEZ-MITCHELL</b> : Yes. Theres another <b>bizarre</b> twist I want to add here for the ANALYSIS. Police <b>revealed</b> that Melissa Huckaby had a relationship with this man, Christian Sinclair
35	2009	SPOK	CNN_Velez	Jane. And I think its very -- its complicated. But heres the simplest ANALYSIS I can give. Here we have a woman that, as Ive read her
36	2009	SPOK	CNN_Dobbs	, save me from Robert. <b>ZIMMERMAN</b> : We went through eight years of faith-based ANALYSIS when it came to fighting <b>terrorism</b> , not based on facts. <b>ROLLINS</b> : That
37	2009	SPOK	CNN_Velez	<b>VELEZ-MITCHELL</b> : Well be back in two seconds. Stay right there for more ANALYSIS of the pretty American <b>coed</b> accused of killing her <b>roommate</b> in Italy. Did Amanda
38	2009	SPOK	CNN_Situation	257114 Post-debate ANALYSIS of the third and final debate of John McCain and Barack Obama. <b>SEN-HILLARY-RODHAM</b> :

Figure 9. 10 consecutive contexts in COCA for the AWL sublist 1 word “analysis.” All non-GSL words that are not proper nouns have been marked in bold based on output from Tom Cobb’s *Web Vocabprofile*.

spoken section--can be understood when one considers that the commonly cited British National Corpus consists of only 100 million words [Burnard, 2009]). Because of the journalistic make-up of COCA’s spoken section, however, a great number of these transcripts deal with current events occurring at the time the programs were recorded, such as the “bird” and American politics contexts in Figure 9. It was not reasonable to assume intermediate EFL learners would have the background knowledge needed to understand these examples and thus many COCA contexts could not be included in DAVI as they failed to meet its second comprehensibility criterion for provided examples. It is possible that required background knowledge would have been less of an inhibiting factor had the genre used been



fiction, the genre that ordinarily has the highest ratio of GSL to non-GSL words after conversation (Nation, 2001). However, this possibility was not examined in the design of this version of DAVI

*Comprehensibility criterion #3.* The third comprehensibility criterion—that examples not use idioms students would be unlikely to know—was similarly affected by I’s use of COCA’s spoken section. Conversation and journalistic language are both very idiom-prone (Schmitt, 2000), so the use of COCA’s spoken section was rather a double-edged sword. I was often forced to make subjective judgments regarding the likelihood of students being able to understand idioms contained in the COCA contexts, and the fact that she preferred to err on the side of safety in order to support students’ incidental learning of the target vocabulary meant that many COCA contexts were unusable for DAVI, e.g. a 2009 context from Fox\_Watch for the AWL word “economic”: “Have they *fanned the flames* of the **economic** situation. . .?”

*Comprehensibility criterion #4.* The fourth comprehensibility criterion also required subjective judgment on the part of I, in that provided examples needed to use polysemous GSL words only with meanings she believed students had already acquired. This criterion affected the usability of contexts such as a 2009 context from Fox\_Beltway for the AWL word “analysis”: “That may *well* happen. I’m not [arguing with] your political **analysis**. It may *well* happen.” In this sentence, “well” means “certainly,” rather than the more common meaning of “good.”

*Comprehensibility criterion #5.* The fifth comprehensibility requirement set by I for COCA contexts used in DAVI was that all provided examples be self-contained. This was so students could understand the examples without reference to supplementary materials. However, this fifth requirement made abiding by the sixth criterion—that all examples be no longer than a single line—challenging. Nevertheless, because it appeared likely that students, as relatively inexperienced readers of L2 English, would have a negative affective response to provided examples that looked too dense, it seemed wise to hold to the single-line stipulation.

*Summary.* The result of these rather stringent requirements for example sentences in DAVI was that few exact quotes from COCA were used. Rather, following Nation &

<b>Original:</b>	let me share with our audience something <b>that you had to say in The Washington Post this week</b> in your analysis of <b>whats going on</b> (NBC_MeetPress, 2008)
<b>Adapted:</b>	let me share with our audience something <b>(a) you said</b> in your analysis of <b>(b) what's happening.</b> *
<b>Original:</b>	That may <b>well</b> happen. I'm not <b>disputing</b> your political analysis. <b>It</b> may <b>well</b> happen. (Fox_Beltway, 2008)
<b>Adapted:</b>	That may happen. I'm not <b>(c) arguing with</b> your political analysis. <b>(d) What you say (e) certainly</b> may happen.*

*Figure 10.* Adaptations made to COCA contexts to meet the comprehensibility criteria for example sentences.. The reason for each change is identified in the key below.

Reason for adaptations made to COCA contexts: (a) original was longer than a single line in DAVI; (b) original used an idiom students were unlikely to know; (c) original contained vocabulary other than GSL words, previously studied AWL words, proper nouns, and additional words students would be likely to know or be able easily to figure out; (d) original was not self-contained; (e) original used a meaning of a polysemous GSL word students were unlikely to know. (Note: Original contexts violating criterion 4--original requires background knowledge intermediate EFL learners are unlikely to have--were generally avoided rather than adapted for use in DAVI and thus are not included in *Figure 10*.)

Deweerd (2001) and Beck et al. (1983), many contexts were simplified or modified in order to provide learners easy access to word meaning (i.e. they were rendered pedagogical contexts), as can be seen in Figure 10. All adapted contexts in DAVI are marked by an asterisk (\*).

### Exact quotes from COCA

The few example sentences in DAVI that ARE exact quotes from COCA are mostly directive contexts, chosen because I believed they would lead learners to an accurate guess of the target word's exact meaning. This can be seen in the first example provided in Figure 11. The context's discussion of loans, cards, and debt directs students to the exact meaning of the AWL word "credit." In a few cases, however, while the first of the three provided examples for an AWL word is pedagogical or directive, one or both of the following examples are either general or nondirective, as can be seen in the second example provided in Figure 11. The primary reason for this is the difficulty I had in locating multiple contexts that were

1	Sample directive authentic context used without adaptation	2009	SPOK	NBC_Dateline	They've also got a car loan, student loans and <b>credit</b> card debt that's \$25, 000 and growing.
2	Sample nondirective context used without adaptation following a directive context	2009	ACAD	Adolescence	she was tired of living in a house continuously under <b>construction</b>

Figure 11. Sample authentic contexts used in DAVI.

either already directive or easily adaptable into pedagogical contexts. The use of these general or nondirective contexts for the second or third example sentence for a target word was not viewed as problematic, however, as the research makes it clear that students do need to encounter target words in multiple contexts and situations of use in order to acquire a clear sense of their semantic boundaries (Cobb, 1998). However, because it was assumed that when students completed the “Find your own example” section of each vocabulary study page, they would most likely find general or nondirective contexts as these are probably the most frequent, having all provided example sentences consist of directive or pedagogical contexts was preferred.

## REFERENCES CITED

- Beck, I., McKeown, M., & McCaslin, E. (1983). All contexts are not created equal. *Elementary School Journal*, 83, 177-181.
- Burnard, L. (2009, January). *British National Corpus: What is the BNC?* Retrieved from <http://www.natcorp.ox.ac.uk/>
- Cambridge Dictionaries Online. (2009). Available at <http://dictionary.cambridge.org/>
- Camtasia Studio (Version 6.0.2) [computer software]. (2009). Okemos, MI: TechSmith Corporation.
- Cobb, T. (1998). Breadth and depth of lexical acquisition with hands-on concordancing. *Computer Assisted Language Learning*, 12(4), 345-360.
- Cobb, T. (n.d.). *Multi-concordance*. Available at The Compleat Lexical Tutor website: <http://www.lextutor.ca>
- Cobb, T. (n.d.) *Web Vocabprofile* [accessed 12 November 2009 from <http://www.lextutor.ca/vp/>], an adaptation of Heatley & Nation's (1994) *Range*.
- Coxhead, A. (2000). A new academic word list. *TESOL Quarterly* 34(2), 213-238.
- Coxhead, A. (2008). Phraseology and English for academic purposes. In F. Meunier & S. Granger (Eds.), *Phraseology in foreign language learning and teaching* (pp. 149-161). Amsterdam: John Benjamins Publishing Company.
- Davies, Mark. (2008-) *The corpus of contemporary American English (COCA): 400+ million words, 1990-present*. Available at <http://www.americancorpus.org>
- Day, R.R., Omura, C., & Hiramatsu, M. (1991). Incidental EFL vocabulary learning and reading. *Reading in a Foreign Language*, 7, 541-551.
- Ding, Y. (2007). Text memorization and imitation: The practices of successful Chinese learners of English. *System*, 35, 271-280.
- Doughty, C. J., & Long, M. H. (2003). Optimal psycholinguistic environments for distance foreign language learning. *Language Learning & Technology* 7(3), 50-80.
- Ellis, N. (2008). Phraseology: The periphery and the heart of language. In F. Meunier & S. Granger (Eds.), *Phraseology in foreign language learning and teaching* (pp.1-13). Amsterdam: John Benjamins Publishing Company.
- Ellis, R. (2008). *The study of second language acquisition* (2nd ed.). Oxford: Oxford University Press.
- Fu, R. (2009, September 24). *China search engine market report 2009*. Retrieved from <http://www.chinainternetwatch.com/261/china-search-engine-market-report-2009/>

- Granger, S. & Meunier, F. (2008). Introduction. In F. Meunier & S. Granger (Eds.), *Phraseology in foreign language learning and teaching* (pp.15-18). Amsterdam: John Benjamins Publishing Company.
- Handl, S. (2008). Essential collocations for learners of English. In F. Meunier & S. Granger (Eds.), *Phraseology in foreign language learning and teaching* (pp. 43-66). Amsterdam: John Benjamins Publishing Company.
- Heatley, A. & Nation, P. (1994). *Range*. Victoria University of Wellington, NZ. [Computer program, available at <http://www.vuw.ac.nz/lals/>.]
- Horst, M., & Cobb, T. (2001, June). *Growing academic vocabulary with a collaborative on-line database*. Paper presented at IT-MELT '01: Information Technology & Multimedia in English Language Teaching, Kowloon, Hong Kong.
- Horst, M., Cobb, T., & Meara, P. (1998). Beyond *A Clockwork Orange*: Acquiring second language vocabulary through reading. *Reading in a Foreign Language*, 11, 207-223.
- Horst, M., Cobb, T., & Nicolae, I. (2005). Expanding academic vocabulary with an interactive on-line database. *Language Learning & Technology*, 9(2), 90-110.
- Hulstijn, J.H., & Laufer, B. (2001). Some empirical evidence for the involvement load hypothesis in vocabulary acquisition. *Language Learning*, 51, 539-558.
- Kennedy, G. Phraseology and language pedagogy. In F. Meunier & S. Granger (Eds.), *Phraseology in foreign language learning and teaching* (pp. 21-41). Amsterdam: John Benjamins Publishing Company.
- Kim, Y. (2008). The role of task-induced involvement and learner proficiency in L2 vocabulary acquisition. *Language Learning*, 58(2), 285-325.
- Krashen, S. (1989). We acquire vocabulary and spelling by reading: Additional evidence for the Input Hypothesis. *The Modern Language Journal*, 73, 440-464.
- Laufer, B., & Hulstijn, J. H. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied Linguistics*, 22, 1-26.
- Liu, N., & Nation, I. S. P. (1985). Factors affecting guessing vocabulary in context. *RELC Journal* 16(1), 33-42.
- Longman Dictionary of Contemporary English. (2009). Available at <http://www.ldoceonline.com/>
- Nation, I.S.P. (2000). Learning vocabulary in lexical sets: Dangers and guidelines. *TESOL Journal* 9(2), 6-10.
- Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.

- Nation, I.S.P., & Deweerdt, J.P. (2001). A defence of simplification. *Prospect*, 16(3), 55-67.
- Nation, P. (n.d.) *Measuring learners' present level of vocabulary knowledge*. Available at <http://www.victoria.ac.nz/lals/staff/paul-nation.aspx> (Vocabulary Resource Booklet/Levels test & word lists/Guide to levels test)
- Pigada, M., & Schmitt, N. (2006). Vocabulary acquisition from extensive reading: A case study. *Reading in a Foreign Language*, 18, 1-28.
- Schmitt, N. (1995). The word on words: An interview with Paul Nation. *Language Teacher*, 19(2), 5-7.
- Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge: Cambridge University Press.
- Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behaviour of two new versions of the *Vocabulary Levels Test*. *Language Testing*, 18(1), 55-88.
- Victoria University of Wellington: School of Linguistics and Applied Language Studies. (2009 October 11). *AWL sublist families*. Retrieved from <http://www.victoria.ac.nz/lals/resources/academicwordlist/most-frequent.aspx>
- Webb, S. (2005). Receptive and productive vocabulary learning: The effects of reading and writing on word knowledge. *Studies in Second Language Acquisition*, 27, 33-52.
- Webb, S. (2007a). The effects of repetition on vocabulary knowledge. *Applied Linguistics*, 28, 46-65.
- Webb, S. (2007b). The effects of synonymy on second-language vocabulary learning. *Reading in a Foreign Language*, 19, 120-136.
- Webb, S. (2008). The effects of context on incidental vocabulary learning. *Reading in a Foreign Language*, 20, 232-245.
- Wible, D. Multiword expressions and the digital turn. In F. Meunier & S. Granger (Eds.), *Phraseology in foreign language learning and teaching* (pp. 163-181). Amsterdam: John Benjamins Publishing Company.
- Wray, A. & Fitzpatrick, T. Why can't you just leave it alone? In F. Meunier & S. Granger (Eds.), *Phraseology in foreign language learning and teaching* (pp. 123-147). Amsterdam: John Benjamins Publishing Company.

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